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The Theory of Contestable Markets and Its Application to the Liner Shipping Industry

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The Theory Of Contestable Markets And Its Application To The Liner Shipping Industry

by

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PREFACE

This report was prepared by Professor John Davies, under contract, for the Research Branch of the Canadian Transport Commission and represents a follow-up to earlier work undertaken by the author for the Branch. The study examines the applicability of the recently developed theory of contestable markets to the liner shipping industry in the Canadian trades. Among other aspects, the report discusses the actual and potential impediments to contestability and identifies ways in which contestability can be enhanced in liner shipping markets. In this context, parts of chapters 5 and 6 have definite policy implications.

Whenever possible, the Branch makes publicly available the results of its research and the present volume is offered in line with this policy. The opinions expressed in this report are, of course, those of the author and do not necessarily reflect the views of the Canadian Transport Commission.

R.W. Lake
Executive Director
Research Branch

December 1985

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Chapter 1

The Study in Perspective

The purpose of this study is to analyse the liner shipping industry, using the concepts and insights provided by the recently developed theory of contestable markets. Although the current literature on the economic analysis of the liner shipping industry is very extensive, much of it is contradictory and some is unconvincing.[1] This is primarily because until now microeconomic theory has not been well equipped to investigate a complex, multiproduct industry like liner shipping and therefore individual researchers, of necessity, have been forced to rely on subjective interpretations of business behaviour and its consequences for performance and welfare more than was perhaps desirable.[2] And individuals, of course, are apt to vary.

The theory of contestable markets, however, aspires to fill this analytic deficiency as it provides both a general perspective and a body of concepts that is tailor-made for the investigation of multiproduct industries with complex cost interrelationships and often a highly concentrated industrial structure. Already it has provided fresh and penetrating insights into the domestic air [3] and rail [4] industries of the U.S.A., banking and financial markets in the U.K. and U.S.A.[5] and general governmental competition [6] and regulation/deregulation policy.[7] Its potential as a medium for the analysis of liner shipping has also been tentatively suggested.[8]

Given this background, then, the present study will endeavour systematically to use the new theory to investigate the workings of the liner shipping industry. The subject matter of the study, however, will not simply be the conduct and performance of individual companies, or associations thereof, but also the welfare consequences which the new theory suggests will accompany the principal policy measures which have traditionally been used to regulate or to promote the liner shipping industry. In addition, the study will seek to compile a compendium of the economic options that may be used either to maintain or to enhance contestability and therefore efficient performance in liner markets.

It is noteworthy that the theory of contestable markets has of late been subject to considerable criticism by the profession and therefore during the course of the inquiry the nature of this criticism and its relevance in terms of the practical analysis of liner shipping will be explicitly addressed.

In terms of approach, the study will assume the following structure. Chapter 2, following this introduction, will summarise the principal findings and analytic techniques of the theory of contestable markets which are of greatest relevance to the analysis of liner shipping. Particular attention will be paid to the theory's treatment of the nature of competition, costs, the welfare properties of the principal types of pricing equilibria it identifies and the stability of those equilibria. The behavioural mandates imposed upon firms when operating in such markets will also be examined.

Chapter 3 will then endeavour to apply the theory to the liner industry through analysing the extent of its contestability and the implications this has for the behaviour of liner firms. The extent of its observable multi-product cost attributes will also be analysed together with its consequences on market structure and pricing.

Chapter 4 will analyse the possibility that the liner industry may be subject to problems associated with an unstable or unsustainable pricing equilibrium. Potential sources of unsustainability will be identified together with the implications they may have for pricing and economic efficiency.

Chapter 5 seeks to survey any actual and potential impediments to contestability that may exist in liner markets. Attention will be directed at both the economic and business constraints that may exist and also those issuing from non-economic sources such as policy measures designed to regulate or promote the industry.

Having previously assessed the extent and potential limitations of the industry's contestability Chapter 6 will endeavour to compile a set of economic options that may be used to safeguard or enhance contestability in liner markets and also to counter any welfare problems that may arise from unsustainability conditions.

Chapter 7 will conclude the study by summarising its principal findings and by identifying the strengths and weaknesses of the new theory in terms of its practical application to the liner industry.

Notes and References

[1] For a recent survey of the literature on the economics of the liner shipping industry see, Davies, J.E., "Pricing in the Liner Shipping Industry: A Survey of Conceptual Models, Canadian Transport Commission, No 1983/o4E, Ottawa/Hull, Jan. 1984.

[2] This observation is illustrated more fully in Chapter 3.

[3] Bailey, E.E. and Panzar, J.C., "The Contestability of Airline Markets During the Transition to Deregulation," Law and Contemporary Problems, Volume 44, Winter 1981.

[4] Damus, S., "Ramsey Pricing by U.S. Railroads," Journal of Transport Economics and Policy, January 1984, and Winston, C., "The Welfare Effects of ICC Rate Regulation Revisited," The Bell Journal of Economics, Spring 1981.

[5] Davies, G. and Davies, J.E., "The Revolution in Monopoly Theory." Lloyd's Bank Review, July 1984.

[6] Bailey, E.E., "Contestability and the Design of Antitrust and Regulatory Policy," American Economic Review, May 1981.

[7] Gaskins, W.D. and Voytko, J.M., "Managing the Transition to Deregulation," Law and Contemporary Problems, Winter 1981.

[8] Davies, op.cit. and also Conlon, R.M. and Zerby, J.A. "Public Policy and the Liner Shipping Industry." Centre for Applied Economic Research, Paper No. 20, University of New South Wales, December 1983.

Chapter 2

The Theory of Contestable Markets - An overview

2.1 Introduction

The theory of contestable markets represents a collection of ideas and analytical techniques which has been developing over the last fifteen years and which has recently been codified into a complete and integrated work by Baumol, Panzar and Willig [1]. It represents a major innovation in microeconomic theory by affording new insights into the positive analysis of industrial performance and also by postulating a new normative standard - the perfectly contestable market - against which to appraise that performance. The ideas and conclusions of the new theory, together with their supporting assumptions, propositions and proofs together comprise an extremely extensive body of analysis: Baumol et al's book amounted to no less than 500 pages and they admitted that it largely represents work in progress as opposed to a completed body of doctrine.[2] It has also attracted considerable, if not constructive, criticism from some quarters.[3] Consequently any summary is bound to carry with it the attendant risks of oversimplification and misintepretation. Although this should never be forgotten, the new theory, fortunately, lends itself to the partial review which is attempted here since many of its most important and relevant ideas have a direct, common sense underpinning and for that very reason many were initially deduced intuitively.[4]

The emphasis of the summary presented here will be on those aspects of contestable market theory which are most appropriate in the analysis and evaluation of conduct and performance in the liner shipping industry. In particular the perfectly contestable market as a normative standard, the behavioural and structural imperatives subsumed in such a standard, competitively relevant cost attributes and the nature and stability of contestable equilibria will all be examined.

2.2 Normative Standards and the Perfectly Contestable Market

Before any appraisal of industrial performance can be made a normative standard is needed to serve as a benchmark against which to judge that performance. The oldest and most important standard is of course the perfectly competitive market which represents the economic structure which brings about the best possible allocation of society's given resources. Here once the industry and its constituent firms have achieved a long run equilibrium, the following conditions will pertain:

(i) price equals marginal cost, which means that society's evaluation of the last unit bought (its price) equals the cost of producing the last unit;

(ii) consumers pay the minimum possible price that is compatible with non-negative profits for producers;

(iii) industrial output is produced at minimum feasible cost;

(iv) plants are of optimal size and utilised with optimal efficiency so that there is no waste of resources; and

(v) firms earn only normal profits.

Given these properties of optimal performance it is of course possible (in theory) to evaluate the results achieved by an actual industry through direct comparison of the actual with the optimal. And even if the quantity and quality of available data is insufficient to enable such direct comparison, the degree to which the likely behaviour of an industry would approach the perfectly competitive state may be readily inferred from its structure. Thus if the number of firms in the industry were so large that no single firm (or probable combination) could by its own actions significantly influence the price of its product, then, ceteris paribus, we have a competitive structure from which will automatically flow the optimal performance described above. And conversely, though methodologically in like manner, as the number of firms decreases, performance will move away from the welfare maximising character of perfect competition and towards that of monopoly which represents the worst possible allocation of resources. Thus it seemed that the performance of an industry could be gauged simply by noting its structure.

Despite the appealing simplicity of perfect competition as a normative standard it soon became evident that it was more in the nature of a conceptual metaphor than of a practical desideratum. In particular the long and restrictive set of assumptions necessary to realise the optimally efficient allocation of resources under perfect competition - J.V. de Graaf has listed no less than seventeen such assumptions [5] - means that the desirable is in reality unattainable.

Moreover, even if all the necessary assumptions did apply, perfect competition would lead to an optimal allocation of resources only under certain more general conditions such as that consumers really are sovereign, that there are no unexhausted economies of scale in any one industry and therefore potential 'second best' problems, that there is no growth or technical innovation in the economy and that there are no externalities.[6]

Consequently when seeking insights into the welfare consequences of the workings of real world market structures it was suggested that, "...

rough theory or good common sense, is, in practice, what we require."[7] In the literature on price theory, this notion was manifested in the emergence of the concept of "workable competition", which basically sought to establish the most desirable forms of competitive behaviour by selecting those which were practically possible given the limits set by the unavoidable constraints of reality.[8] The essence of workable competition revolves around the notion that when analysing actual markets it is performance which is of ultimate importance and not any abstract requirements of structure and conduct. For since the market, technical and institutional environments of each industry are likely to vary, it is very difficult to establish firm criteria as to what constitutes desirable structure or conduct prior to a study of actual performance, as any formal listing of specific market conditions can have but very limited applicability.[9]

Workable competition, then, rejects the use of perfect competition as a measuring rod for the normative appraisal of actual markets, but since it explicitly recognises that industries may differ considerably, it becomes very difficult to define what actually does constitute workable performance. For this reason, it has been proposed by J.W. Markham that an industry's overall performance can be appraised by relating it to a background of possible remedial actions. In his parlance, then,

> "An industry may be judged to be workably competitive when, after the structural characteristics of its market and the dynamic forces that shaped them have been thoroughly examined, there is no clearly indicated change that can be effected through public policy measures that would result in greater social gains than social losses."[10]

Though noble in intent, the problem with this approach is that it provides no real guidance: it simply invites subjective assessments. And that is the real problem generally with workable competition as a normative standard. The rough theory which it invokes is just too rough and its appeals to common sense are really an abandonment of the search for an objective guide.

The concept of a perfectly contestable market marks a significant advance over both the above benchmarks, being much more relevant than perfect competition and much more precise than workable competition. In many ways, however, it is very similar to the former in that it is associated with identical performance.[11] For that reason it has been described as "...a generalisation of the theory of perfect competion"[12], the generalisation being that it assimilates scale economies which are inimical to the latter.

The perfectly contestable market is one where entry and exit are absolutely free and easy. The emphasis, however, is firmly on ease of exit as this condition is seen as the guardian of free entry. Thus if a firm could leave its industry and in the process of departure, could retrieve all costs, save normal depreciation, associated with its initial entry, it will have lost nothing in the exercise. The act of entry, therefore, would be materially riskless and therefore without impediment. Completely free entry, of course, means that firms already in business are decisively disciplined by the threat of potential entry. Consequently the participating firms, irrespective of their actual number, will be forced to act as if, or almost as if, they were in a perfectly competitive situation.

Concerning the difference between the two standards, the optimal performance of perfect competition is seen as a function of industrial structure which, in turn, generates a certain type of behaviour - atomistic competition - and it is that behaviour which secures the optimal performance.

The identical, optimal performance of a perfectly contestable market is a function, however, of technology not structure: if the technology of production allows ease of exit, entry is unconstrained and therefore the need to deter potential entry will demand of firms optimal economic performance.

In terms of their practical application, it is much easier to identify the conditions necessary for perfect contestability than for perfect competition. The conditions underlying the latter, as mentioned previously, are extremely demanding. In contrast, to secure the frictionless exit and entry required for perfect contestability, three principal conditions are required.

Firstly, on the production side, entrant and incumbent must be symmetrically placed, being subject to the same regulations, having access to technology of the same vintage and being perceived to produce outputs of similar quality. Secondly, in the technology of production sunk costs must be absent. This is likely to be the case whenever the capital employed is reusable, salable, movable, rentable or when production can be subcontracted. Together these two conditions mean that the entrant is both able to compete successfully and can do so at little risk, being able to withdraw, if conditions so warrant, and to recoup in the process of withdrawal any costs, irrespective of their amount, incurred in consequence of his initial entry (normal depreciation charges aside). Thirdly, the pricing practices of the market must be such as to allow the actual entrant some guarantee of positive profit: this will be the case if consumers respond to price differences with a shorter reaction time than do incumbents or else if entrants are able to secure contracts with customers so as to allow a period of positive profit before, possibly, retiring. This third requirement is often referred to as the "price sustainability" condition.

It should be noted that there is no necessary correlation between economies of scale and sunk costs - the biggest impediment to contestability. It is quite possible for technologies admitting of substantial economies of scale to give rise to very few sunk costs [13] and this of course implies that the concept of a contestable market is not bound to any particular industrial structure.

Similarly, a high proportion of fixed costs in an industry's cost structure will constitute no automatic impediment to exit and entry unless those costs also happen to be sunk, a coincidence of no necessity.[14]

Finally, it should also be noted that perfect contestability, like perfect competition, is an ideal and as such carries with it no presupposition of necessary existence. Its relevance and its operational use turn on the practical possibility of being able to judge the extent to which the actual characteristics of an industry approach the ease of exit requirement of perfect contestability and this, in turn, allows an evaluation of the degree to which the actual parameters of industrial equilibrium are likely to be at variance with those of the perfectly contestable state.

2.3 Behavioural Imperatives and Structural Attributes of Perfectly Contestable Markets

Having outlined the nature of a perfectly contestable market it will be instructive now to examine in more detail the behavioural requirements it imposes upon firms and the performance attributes of the condition.

Given the possibility of costlessly reversible entry - which is the hallmark of the perfectly contestable market - it is evident that any prices which yield a positive economic profit will induce entry until that profit has been eliminated. This will be true even if the initial profit opportunity was but slight or temporary. What secures this result, of course, is the fact that the pursuit of profit is without risk and therefore will irresistably induce into existence actual entry, somewhat in the manner of the erstwhile biological principle of spontaneous creation.

Adherence to such a proposition, albeit relevant to but the limiting condition, requires however a certain prior philosophical position in respect of the magnitude of the pool of potential entrants which are spontaneously to fill profitable market openings, even those requiring large investments. Baumol's position in this respect is quite clear, as revealed in the following statement:

> "Given the opportunity for profit and the absence of entry and exit costs, the world will prove full of potential entrants. They are likely to come from unexpected directions, from other industries, or other countries, financed by conglomerates or by other unexpected sources."[15]

Given such a perspective [16], two results automatically follow. Firstly, the only profits which can be earned in the long run are normal profits. Secondly, the only way a firm can maintain its market position is to make profitable entry impossible. And this, in turn, will require of it two things. Firstly, it will have to sell the demanded output at a price no higher than unit costs of production, for given perfect contestability any prices that generate positive economic profits would automatically induce entry. Secondly, the incumbent will have to produce the demanded output at the lowest possible cost as any inefficiency would imply positive profits for more cost conscious competitors, something which again would automatically induce entry. Indeed, and to extrapolate this latter argument, perfect contestability makes impossible inefficiency of any kind. For the firm, this means that its plant must be of the optimum size and utilised with otpimum efficiency and likewise there must be no x-inefficiency. The impossibility of inefficiency also means that contestability is incompatible with corporate objectives such as revenue maximisation, growth maximisation, satisficing etc, to the extent that these imply departures from the normal profit, optimally efficient price and output configuration.

These behavioural mandates dictate that the only objective function that is compatible with survival is profit maximisation. Survival and the consequential need to deter entry would normally suggest that it is long run profit maximisation that must be pursued, though the possibility of hit and run entry implies that in a perfectly contestable market, the long run may be much shorter than normally imagined. The pursuit of this objective, moreover, results in performance similar if not identical to that of perfect competition only now, with the exception of natural monopoly - which will be discussed subsequently - it is common to all industrial structures.

With respect to industrial structures, the very same forces that discipline the behaviour of firms also serve more generally to shape the pattern of industrial organisation. In particular the impossibility of inefficiency means that in perfectly contestable markets a stable industrial structure has to be the most efficient possible structure and that structure, moreover, must arise from the free play of market forces. Thus allocative inefficiency becomes impossible because the need of firms to minimise costs when coupled with the forces of entry and exit would deny survival to the inefficient structure just as they would to the inefficient firm. And by symmetry no organisation or cooperative arrangements among firms can be maintained unless they possess some survival value and promote in some positive way general cost efficiency.

2.4 Cost Concepts Relevant to the Multi Product Firm

The impossibility of inefficiency and the consequential need of firms to minimise costs is clearly one of the most striking implications of a perfectly contestable market and therefore is deserving of greater attention. Traditionally in economic analysis cost efficiency is analysed through reference to the level of a firm's average costs, something which in turn is influenced by the size of the firm's chosen plant and the consequential degree to which it affords the realisation of economies of scale, and also by the utilisation of that chosen plant.

With respect to the latter, contestable market theory has almost nothing to say about capacity utilisation and short run cost behaviour. It is simply assumed implicitly that the disciplines of perfect contestability will force them to be optimal.[17] Concerning long run cost analysis, however, the methodology provided by the new theory is extremely rich and really for the first time allows the long run cost behaviour of multiproduct firms to be analysed in a competitively relevant way.

In contrast to single output production where the extent of scale economies can be gauged simply through reference to the behaviour of long run average costs, there is no single measure of scale economies in a multiproduct setting. Primarily this is because the concept of average cost, or total cost divided by the quantity of output, ceases to have any meaning when the quantity of output is an assortment of different goods. But there are, however, properties of multiproduct cost functions that resemble single product scale economies and which influence cost minimising equilibria and industrial structures. Those of greatest relevance in this respect are product specific economies of scale and economies of scope.[18]

Concerning the former, if a new product is added to the bundle currently produced certain additional or incremental costs will be imposed upon the firm. Now assuming that the output of all other goods is held fixed so as to cause the incremental cost to be generated solely by the new product, it will be possible to calculate incremental costs per unit of its output i.e. average incremental costs. If these costs fall, rise or are constant as output of the new product is expanded, production will be subject to product specific economies, diseconomies, and constant returns to scale respectively. The significance of these measures lies in the influence they have on industrial structure. Thus if the production of a good displays continuous product specific economies of scale then that product line would have to be monopolised if the costs of supplying the market are to be minimised. Associated with this structural mandate is a pricing constraint similar to that of other monopoly situations; namely that under product specific economies of scale marginal cost pricing will not be financially viable because the cost of each additional unit will be less than the average cost of the entire product line, when that product line is itself viewed as an increment to the firm's other outputs.

Despite its importance in the analysis of the determinants of industrial structure, the measure of product specific economies of scale is in some ways weak in that its computation is based upon ceteris paribus changes in the output of one product only. As such it cannot fully embrace the behaviour of costs consequential on the simultaneous adjustment of two or more separate outputs. Fortunately, however, these relationships can be captured by the concept of economies of scope.

Economies of scope are said to exist when a single firm can produce a given level of output of each product line more cheaply than can a combination of separate firms, each producing a single product at the given output level. In other words, in terms of the costs of the simultaneous production of a set of products, economies of scope imply that the whole is less than the sum of its parts. Concerning their origin, economies of scope arise principally from the joint utilisation of inputs, something which can occur when outputs are produced jointly, or more importantly, where the indivisible costs of fixed factors or common overhead facilities can be spread by extending the product line.

Although economies of scope imply that simultaneous production is cheaper than separate production there is no guarantee that their presence will automatically bring about multiproduct firms. For the very change in the composition of output that enables the realisation of economies of scope will also give rise to product specific returns to scale. Now if production is such that product specific economies of scale are strong in one or more products and economies of scope, though present, are relatively insignificant, there may be no cost advantages to be realised from multiproduct production. (This would be especially true if each additional product line generated a fixed, start-up cost in consequence of retooling etc.) In this particular case, production would be effected by a single product monopolist because, as noted above, continuous product specific economies of scale imply that the product line must be monopolised if costs are to be minimised.

If, however, the effect of economies of scope on costs was stronger than any product specific returns to scale there would be advantages in multiproduct production. Thus if production generated both continuous product specific economies of scale and strong economies of scope then one would expect the resultant industrial structure to be a multiproduct monopoly.

In markets other than monopoly, product specific economies of scale are not present at the relevant ouput levels and therefore no relative assessment of their strength vis a vis economies of scope is required. The presence of the latter mean that simultaneous production is cheaper than separate production, there are no product specific economies to counter this and therefore economies of scope in themselves will be sufficient to guarantee multiproduct production.

An important side effect of the complex nature of scale economies in multiproduct production concerns the determination of necessary and sufficient conditions for natural monopoly. Continuous economies of scale is no longer enough because of the different types of scale economy that can be defined in multiproduct cost functions, because of the necessity of taking cognizance of cost complementarities and finally because the new theory also has shown that natural monopoly may be compatable with certain types of decreasing returns to scale.[19] In multiproduct production, then, there is no single unique set of necessary and sufficient conditions for the existence of the structure: in contrast there exist a variety of cost combinations that may bring it about.[20] Because of this a much wider definition of natural monopoly is required in a multiproduct context than simple reference to economies of scale and to this end contestable market theory teaches that it is subadditivity of costs that is the appropriate concept to be used in the formal definition of natural monopoly.

Essentially, subadditivity means that the cost of producing a given set of products at each and every combination of output and at each and every level of output relevant to the pertaining conditions of demand, is less if done by one firm than if done by two or more. It is thus similar in nature to economies of scope except that there is no presumption in the latter that the constituent cost complementarities reign over each and every output level.

2.5 The Nature and Stability of Contestable Equilibria

In contrast to orthodox price theory which provides different equilibria for each type of market structure, only two types of stable equilibria possible in perfectly contestable markets, namely that generated by natural monopoly and that which is common to all other market structures. Both types of equilibrium, moreover, have the following elements in common:

Firstly, market demand must be satisfied as efficiently as possible.

This will mean that production must take place without x-inefficiency and that the size of plant, its utilisation and the product mix appropriate to market demand are all such as to minimise costs.

Secondly, the prices charged by the firm must be such that the total revenue it receives from the sale of its total output must equal the total costs of producing that output, leaving the firm thereby with only normal profit. The above two conditions both flow from the requirement of an equilibrium that profitable entry be impossible.

Thirdly, the number of firms comprising the industry must produce the aggregate industry output at least cost, because contestability is incompatible with allocative inefficiency.

Fourthly,no cross subsidies are possible between the outputs produced by firms. For if an incumbent firm charges for a product (or set of products) a price which results in incremental net revenues that are less than the incremental net costs which production of that product imposes - so that its price is effectively subsidised - an entrant, by offering only the remunerative, unsubsidized products could undercut the incumbent on his remaining product set and drive him out of business. Thus prices which allow no profitable entry must admit of no cross subsidisation.

Fifthly, and related to the above,the price of any product must be at least as great as its individual marginal costs. For if an incumbent firm is pricing one of its products below marginal cost and is not in the process making a loss, an entrant, if he was to replicate the output levels of the incumbent with respect to all products sold at or above MC but was to reduce output of the particular product sold at below MC so as to cut out all units sold below that price, would thereby be able to reduce his total costs more than his total revenues and thus earn greater profits than the incumbent at the prices charged by the incumbent. This, of course, means that the entrant is in a position to undercut the incumbent and gain profitable ingress to the market. Consequently prices which make profitable entry impossible, as required for an equilibrium, cannot be less than marginal cost.

All the above characteristics, then, will be present in any contestable equilibrium, be it natural monopoly or otherwise. As for the key distinction between the two cases, this concerns the determination of the actual prices to be charged.

Concerning firstly structures other than natural monopoly, the firm will have no discretion over price: it will have to price each product at marginal cost if entry is to be deterred. As noted above, price cannot be set less than MC and by symmetry they cannot be higher than MC, for if an incumbent charged one of its products a price in excess of MC, an entrant, by expanding production of the particular product in question beyond the level currently produced by the incumbent could earn more profit than the incumbent at the prices currently charged by the latter, since each unit sold for which $P > MC$ adds more to total revenue than it does to total costs. Being able to earn more profit at current prices than the incumbent means of course, that the entrant is in a position to undercut the incumbent and therefore gain entry to the market. Consequently an equilibrium, under which profitable entry is impossible, demands that prices cannot exceed MC.

In markets other than monopoly, then, an equilibrium demands that $P = MC$, as in perfect competition, though the rationale of this is no longer a marginalistic calculus of maximum short run profits but the strategic need to prevent the materialisation of potential competition. It is thus evident that in a perfectly contestable market, the expectations and reactions of incumbents, which have traditionally been used to analyse oligopoly equilibrium, are all irrelevant, though of course they may reassume significance in markets where contestability diminishes.

Turning now to natural monopoly, it, like any other market structure, will possess the characteristics outlined previously. The distinguishing feature of the natural monopoly, however, is the subadditivity of its cost function and it is the pricing mandates of the conditions which promote this which bring about the characteristics of a contestable equilibrium that are unique to the monopoly structure. In particular marginal cost pricing, as in the traditional single product case, is not financially viable in a multiproduct natural monopoly. Given this situation, the next best pricing alternative from society's point of view would be for the firm to charge Ramsey optimal prices, which are structured such that the relative deviation of price from marginal cost is the same for all goods and is also inversely proportional to elasticity of demand. Now Baumol et al have shown that a natural monopolist may well spontaneously do this as it may be the easiest way for it to discern a set of prices that guarantees entry deterence.[21] Thus whereas in non-monopoly markets a first best, Pareto optimal pricing solution is guaranteed by the forces of contestability, the very same forces may yield a second best solution in the natural monopoly context.

Not all natural monopolies, however, potentially result in such a desirable equilibrium, indeed under certain circumstance no equilibrium may be possible. If total market demand can be satisfied only when the incumbent is producing in a region of decreasing returns to scale, for example, it may be impossible for it to deter the entry of partial suppliers.[22] Moreover, and of potentially even greater consequence, if demand is growing and the incumbent natural monopolist seeks to construct a plant capable of satisfying demand in two or more successive time periods it may be impossible for it to fend off socially inefficient entry because of negative complementary relationships that may exist between production in different time periods.[23]

At first sight however, the reverse may appear to apply for being able to use the same plant to produce outputs in two or more successive time periods should yield sufficient positive intertemporal cost complementarities to enable the incumbent to enjoy a commanding advantage over any firm choosing to produce simply in any one period. While this advantage is very real it may nevertheless be overwhelmed by the compounding opportunity cost of holding idle resources in anticipation of future demand. The negative intertemporal cost complementarities that bring about this type of unsustainability consist, then, of the tied up resources, the interests costs and the added risk premiums that constitute this opportunity cost.

The significance of the above described unsustainability conditions is that in their presence there is no guarantee that the existent industrial structure is the most efficient structure even if the market is otherwise perfectly contestable. Moreover, it may be that the only way the efficient structure could be achieved and maintained is if the incumbent were to employ tactics - such as predatory pricing or the threat of predatory pricing - expressly designed to kill off actual and to deter potential competition. If not, then government intervention may be required, to limit entry, for example, or, to cite the solution most appealing to Baumol et al, to require all entrants to serve the entire market as opposed to leaving them free simply to skim the cream.[24]

2.6 Conclusion

The above account concludes our survey of the principal findings of the theory of contestable markets. Although aspects of the theory have come under some criticisms of late, as will subsequently be analysed, it is still widely agreed by the academic community that it constitutes a major advance in our understanding of the functioning of modern business.[25] The task now at hand, then, will be to see how the above described principles can be applied to the specific case of liner shipping. This will constitute the subject matter of the next Chapter.

Notes and References

[1] Baumol, W.J., Panzar, J.C. and Willig, R.D., "*Contestable Markets and the Theory of Industry Structure*." (Harcourt Brace Jovanovicn Inc., New York, 1982).

[2] *Ibid*, page 483.

[3] See eg. Weitzman, M.L., "Comment," *American Economic Review*, June 1983; Schwartz, M., and Reynolds, R.J., "Comment," *American* Economic Review, June 1983; and Spence, M., "Contestable Markets and the Theory of Industry Structure: a Review Article," *Journal of Economic Literature*, September 1983.

[4] Baumol et al, op.cit, Preface.

[5] J.V. de Graaf, "*Theoretical Welfare Economics*," (Cambridge U.P. 1957), p. 142.

[6] See eg. Scherer, F.M., "*Industrial Structure and Economic Performance*," (Rand McNally, 1970), pages 19-27.

[7] Little, I.D.M., "*A Critique Of Welfare Economics*," (Oxford U.P., 1960), p.279.

[8] See eg. Clark, J.M., "Toward a Concept of Workable Competition," *American Economic Review*, June 1940.

[9] Sosnick, S.H., "A Critique of the Concepts of Workable Competition," *Quarterly Journal of Economics*, Volume 72, 1958.

[10] Markham, J.W., "An Alternative Approach to the Concept of Workable Competition," *American Economic Review*, June 1980.

[11] Except under natural monopoly structures, which will be examined subsequently in the text.

[12] Spence, op.cit., p. 981.

[13] Bailey, E.E., "Contestability and the Design of Regulatory and Antitrust Policy," *American Economic Review*, Volume 71, 1981.

[14] Baumol, et al op.cit., pp. 288-290.

[15] Baumol, W.J., "Contestable Markets, Antitrust and Regulation," *The Wharton Magazine*, Volume 7 (1982), p. 20.

[16] It would, of course, be quite legitimate to adhere to alternative positions and in many ways Baumol's philosophy, denying as it does the possibility that entrants may constitute a scarce resource, contradicts one of the most basic tenets of neoclassical economics.

[17] In terms of its application to scheduled transportation industries, this, unfortunately, is a major ommission given the nature of the operational constraints that may prevent optimal capacity utilisation. This problem will be discussed in more detail in Chapter 3.

[18] Contestable market theory, it should be noted, also identifies a further cost concept, namely ray average costs, which measures the costs generated by adjusting the output of a constant mix of products. On its own, however, the measure is of very limited use because, as Bailey and Friedlaender point out, "...since product mixes rarely remain constant as output changes, changes in ray average costs will typically not be observed." (See Bailey, E.E. and Friedlaender, A.F., Market Structure and Multiproduct Industries. Journal of Economic Literature, Volume 20, (1981), p. 1030). Its function is primarily to assist in the analysis of a pricing equilibrium.

[19] See Baumol et al, p. 30.

[20] Ibid. Chapters 7 and 8.

[21] Ibid., pp. 208-217.

[22] Ibid., p. 30.

[23] Ibid., Chapter 13.

[24] Ibid., pp. 217, 364, 407.

[25] Spence, op.cit.

Chapter 3

Contestability Theory and the Liner Shipping Industry

3.1 Introduction

In this chapter those aspects of the theory of contestable markets just discussed will be explicitly applied to liner shipping. In particular an assessment will be made of its contestability and the likely corporate behaviour that this will give rise to. The cost concepts of the theory will also be matched against the industry and an evaluation made of its market structure and its consequential pricing equilibrium.

3.2 Competition and Contestability

Attitudes regarding the strength of competition in the liner industry have traditionally varied greatly, traversing a full spectrum from the highly competitive [1] to the highly monopolistic.[2] The disparative views here have essentially issued from three sources. Firstly there has been the difficulty of reconciling the "large numbers" or "individual actions" requirements for effective competition in (non-Chicago) theory with statements from shipowners about the practical limitations of their market power notwithstanding their cartel organisation. Secondly there has been a massive absence of other than anecdotal data on such obvious indicators of competition as new entry. Thirdly, there has been confusion about how properly to interpret what information there has been on new entry: thus adherents to the monopoly school have argued that for entry "...to create a serious restraint on conference monopoly power there would have to be an inexhaustible supply of willing, well financed entrants..."[3] while supporters of the potential competition school, in contrast, claim that "...even if there is only one firm in the industry it is still oligopolistic provided that the threat of potential entry exists."[4] In consequence, it has been impossible to judge, for example, whether a single instance of entry should be interpreted as a testament to competition,or else, when contrasted against some unspecified larger number, as evidence of the general difficulty of new entry and therefore as confirmation of the monopoly power of conferences. This last problem, of course, is a reflection of the previously described difficulty of defining conditions for workable competition that could be applied across industries.

It is suggested that the concept of contestability goes a long way towards resolving the first and third problems listed above while some recently released Canadian data provides really for the first time a comprehensive description of entry in the industry. It should be noted, however, that the concept of a contestable market, as a means of classifying reality, has attracted considerable criticism of late. In particular W.G. Shepherd has dismissed the concept of a contestable market as "a theorist's toy and a trivial case,"[5] and as "...a theory urgently in search of facts."[6] Particularly objectionable to him was the seeming lack of a single concrete example of an industry that had a non-competitive internal structure, was subject to hit and run entry, was vulnerable to large scale entry and where entry and attempts to deter entry consequently exerted a dominating influence over the behaviour of firms, all of which are conditions which one would expect to see associated with markets defined as contestable.

An attempt will consequently be made here not simply to assess the degree of contestability experienced in liner markets but also explicitly to discharge Shepherd's existential critique of the contestability principle.

3.2 (i) Conceptual Issues: the Contestability Conditions and the Environment of Liner Shipping

As noted in Chapter 2, three conditions must be realised if a market is to be described as contestable, namely a symmetrical treatment of entrant and incumbent, an absence of sunk costs and price sustainability. The degree to which liner shipping markets can satisfy these conditions will now be assessed.

With respect, firstly to the relative standing of entrant and incumbent, both have access to identical technology: the market for new or used vessels and equipment is a world market in which all firms can equally make purchases.[7] Under carriage of goods law all firms too are equally placed.[8] Differences can arise when entry controls (cargo reservation), flag discrimination, state lines and differential subsidies are in operation which is true on some trades, especially to socialist or third world countries. However, between industrial countries, where flow the vast majority of the world's liner cargo, discrimination is not practised, being contrary to the OECD Code of Liberalisation. These countries, moreover, have also enacted enabling legislation allowing them to neutralize the potential non-commercial competition of state backed lines. Similarly the subsidies which these countries extend to their shipping are now generally minimal in extent and are also aimed largely at maintaining commercial competition in the face of the low labour costs and taxes available under flags of convenience registries.[9] Thus commerical competition, with entrant and incumbent symmetrically placed, while not being universal is certainly the rule on intra OECD trades, trades which in the case of Canada generate some 78% of its total liner traffic.[10]

Turning now to the nature of the capital required by the technology of production, it is evident that although capital requirements are often high and a relatively large proportion of total costs consequently fixed [11] they do not give rise to significant sunk costs. The inherent mobility of ships, in contrast, say, to a Channel Tunnel, allows them to be moved from trade to trade and the existence of an active second hand market means they can also be disposed of relatively easily.[12]

The consequential ease of exit afforded by the nature of shipping investments becomes still greater when one considers the business environment within which liner companies operate. In the first place whereas in the days of break-bulk services the physical characteristics of vessels in terms, eg. of speed, reefer space or the ratio of bale to deadweight capacity were often tailored to the needs of specific routes thus inhibiting movement, resale or leasing, the near global standardisation of equipment that accompanied the container revolution has rendered these constraints irrelevant. Equipment currently on the market can be used virtually anywhere. Secondly, entry into the industry does not necessarily demand the prior purchase of equipment and this, in turn, makes exit still easier. Vessels, containers and other equipment may be chartered or leased and indeed some major companies acquire almost all their assets through the rental market.[13] It is also an increasing practice for some suppliers of liner services - the so called Non-Vessel Operating Carriers (NVOCs) to subcontract the physical production of the service, through chartering space on the vessels of regular liner companies.[14]

With respect to the third requirement for contestability, slow price responses by incumbents or the possibility of contracts for entrants, both of these conditions are experienced in the industry. Concerning the former, one of the problems of conference cartels is that changing prices normally requires consensus among member lines something, in turn, which has resulted in an "...inability to take a rapid and unified rate stance to match outsiders...", a problem that has been cited as the proximate cause of the entry induced instability experienced on trans Pacific trades.[15] As for the negotiation of contracts by new lines this is normal practice to the extent that departures therefrom are virtually unheard of. Such contacts may be either official, explicit arrangements [16] or else, more commonly, a less formal result of the inescapable negotiation between shipowner and shipper, the only way by which the former can obtain cargo.[17]

It thus appears that on commercially orientated trades the technical and business environment of the liner industry closely matches the requirements of the extreme, ideal, perfectly contestable market. It remains now to be assessed whether the empirically observable characteristics of the industry accord with the expectations of the theory.

3.2 (ii) Testing for Contestability: Evidence from the Canadian Trades

It was noted earlier that there has been confusion in the minds of contemporary students of the industry over how properly to evaluate the impact of instances of new entry. This problem seems also to infect the work of Baumol et al who claim that the most obvious indicator of contestability is "...a history of frequent entry and exit,"[18] yet elsewhere assert that an absence of entry does not in itself imply that an industry is not highly contestable for it may be the consequence of competitive pricing which in turn would make profitable entry impossible: it thus may be a symptom "...of virtue, not of vice."[19] It seems then, that the authors of the principle perceive a history of frequent entry and exit to be a sufficient but not necessary demonstration of contestability: it may also be present in the absence of such a history under an appropriate technological and business environment.

A priori reasoning about environmental conditions in itself is unlikely to satisfy disbelievers like Shepherd. Massive scale entry, hit and run contests and concrete evidence of entry nullified monopolies or dominant firms would likely be required in addition to a demonstrable history of frequent entry and exit. Fortunately, it is possible to test for all of these conditions in the Canadian liner trades.

The data to test for these phenomena come from two sources. Firstly, the Canadian government compiles data on the number of lines and the volume of cargo each lifted, and this is available for all 73 Canadian trades for the period 1977-1979 and for the 9 principal trade routes for the period 1976-1979. From this source the global incidence of entry and exit and its determinants are analysed in Tables 3.1 and 3.2 while in Table 3.3 disaggregated data is presented for the 9 principal routes in order to allow for an evaluation of the impact of entry.

A problem with the above data is that they do not identify how many separate companies provided the liner services analysed. This is a significant omission as many companies supply services on several different routes. Fortunately data on this drawn from trade directories and covering the longer period 1977 to 1982 has recently been published and this is summarized in Table 3.4.

Precisely how much entry and exit is required to constitute a "frequent history" has been spelled out by nobody. However, as revealed in Table 3.1,

Table 3.1

Entry Into and Exit From Canadian Liner Trades Over The Three Year Period 1977-1979[1]

	Number of Services[2] in 1977		Number of Services in 1979		Entry	Exit[3]	
	Within Conferences	Outside Conferences	Within Conferences	Outside Conferences		From Conferences	From Independents
	244	129	238	178		74	35
Total	373		416		152	109	

Notes

[1] The figures are a population not a sample and cover 73 unidirectional trade routes and represent the most recently available data at the time of writing.

[2] Services refers to the number of separate liner services provided. Thus if one company had services on two different routes this is included in the table as two services. From Table 3.4 it is evident that the 373 services supplied in 1977 were provided by 75 different companies while by mid 1978 the number of companies had increased to 91.

[3] Figure includes only services which have completely terminated, not transfers from conference to independent sector or vice versa.

Source: Data base of the Water Transport Committee of the Canadian Transport Commission. The figures both in aggregate form and on a trade by trade basis are published in Davies, J.E., "Pricing in the Liner Shipping Industry: a Survey of Conceptual Models" Canadian Transport Commission, Ottawa/Hull, January 1984.

the Canadian liner trades as a whole must surely come close to it: starting from an initial situation of 373 separate services in 1977 they had witnessed by the end of 1979 no less than 261 movements comprising 152 entrances and 109 exits. Concerning entry, the number of new services introduced was some 41% of the original number. With respect to exit, of the 109 services that terminated, 74 were supplied by conferences. This figure, it should be emphasised, is one of net exit including only services that ceased completely and not those which simply transferred out of conferences to the non-conference sector of each route. Over the three years covered, then, 30% of all conferences services terminated. For comparison 27% of non-conference services similarly terminated. This picture is hardly supportive of the popular perception that conference cartels serve to protect the inefficient.

In Table 3.2 an attempt is made to test statistically whether the rate of entry and exit is related to the number of services offered at the beginning of the period and the size of the trades measured in terms of the volumes of cargo moving. Bearing in mind the cross sectional nature of the data used, all the results are reasonable. In particular the rate of entry is seen to be strongly related to the size of the market as measured by both the number of services it supports and the cargo volumes it generates. From this, it may be tempting to infer that scale economies may constitute an entry barrier in small trades, despite the teaching of contestable market theory. However, it should be noted that given the multi-product nature of the liner shipping industry, the price depressing effect of an entrant need not be large, even in very small trades, since often only a fraction of a vessel's total carrying capacity

Table 3.2

Results of Regression Analysis of Entry into Canadian Liner Trades

Regression Sought	Regression Constant	C_1	C_2	R^2	F-Statistic	Standard Error
C_3 on C_1	-0.497 (-1.773)*	0.460 (11.563)		65.21%	133.08	1.406
C_3 on C_2	1.233 (5.038)		0.505 (7.251)	52.55%	52.573	1.807
C_3 on C_1, C_2 together	-0.473 (-1.661)	0.446 (9.659)	0.257 (0.602)	65.39%	66.123	1.4131
C_4 on C_1	0.512 (1.340)	0.504 (9.271)		54.76%	85.94	1.918
C_4 on C_2	2.444 (7.744)		0.533 (5.927)	33.10%	35.134	2.332
C_4 on C_1, C_2	0.659 (1.702)	0.428 (6.144)	0.161 (1.693)	56.54%	45.53	1.893

Notes:

*Figures in brackets are the T-statistics.

The type of regressions used were OLSQ.

Entry and exit was computed over the three years period 1977 to 1979.

The number of observations (trade routes) was 73.

The notation used in the table is as follows:

C_1 = number of lines operating in 1977

C_2 = total liner cargo generated on the trade in 1977.

C_3 = total entry (i.e. the number of new lines which commenced services over the period 1977-1979.

C_4 = total entry and exit.

Source: See Table 3.1.

need be committed directly to moving liner cargoes - the rest being used, e.g. to carry bulk cargoes - thus precipitating an insignificant decline in price. As evidence of this, of the 416 liner services which were operating in Canadian trades in 1979, almost 20% carried less than 1000 tons of liner cargo in that year![20] Thus while both common sense and statistics suggests that the number of entrants is likely to be greater in big trades than small this does not imply that entry is relatively more difficult in small, a conclusion also reinforced by the specific multiproduct nature of the industry.

Missing from the above analysis has been any assessment of the impact of entry: very small scale entry is possible, as noted above, and if all entry is of this nature its consequence will be minimal. To overcome this deficiency Table 3.3 analyses the impact of entry on each of Canada's nine principal trade routes. On all these trades the rate of entry has been high notwithstanding the dominant position of the cartel on some routes. The size of the average entrant relative to the average incumbent varied considerably between trades though typically they were smaller. However, when one considers size simultaneously with the number of entrants, the impact of entry has generally been substantial: thus column 9 measures the amount of entry in terms of "incumbent equivalents" and when one compares this with the original number of incumbents it is evident that the consequence of entry on some trades has been truly massive. This conclusion is reinforced when one considers the absolute size of the largest entrant (column 8) which on five of the nine routes was greater than the average incumbent and more than three times greater in one case.[21] Admittedly the

Table 3.3

An Analysis of Entry and Exit on Canada's Principal Liner Trades, 1976-1979

	1 No. of Services, 1976	2 CRC[1] 1976	3 CRC 1979	4 No. of Entrants	5 No. of Exits[2]	6 No. of hit and run entrants[3]	7 Relative Size of the average Entrant[4]	8 Relative Size of largest Entrant[5]	9 7 x 4[6]
East Canada - Japan China, N/S Korea and Pacific USSR	7	0.80	0.64	3	1 (0)	1	0.70	1.59	2.1
Japan, China, N/S Korea Pacific USSR to East Canada	9	0.71	0.86	3	2 (1)	2	0.93	2.26	2.79
West Coast Canada to China, Japan, N/S Korea and Pacific USSR	11	0.34	0.15	13	3 (3)	1	0.65	3.35	8.45
China, Japan, N/S Korea and Pacific USSR to W. Coast Canada	15	0.81	0.63	12	8 (4)	3	0.53	1.12	6.36
East Coast Canada to Continental Europe	11	0.52	0.53	6	5 (2)	1	0.48	0.66	2.88
Contental Europe to East Coast Canada	12	0.51	0.47	4	4 (2)	1	0.29	1.18	1.16
W. Coast Canada to Continental Europe	8	0.65	0.53	11	4 (4)	1	0.15	0.39	1.65
U.K. and Ireland to E. Coast Canada	10	0.97	0.98	6	6 (3)	2	0.16	0.66	0.96
East Coast Canada to U.K. & Ireland	9	0.98	0.87	6	6 (3)	2	0.38	0.71	2.28

Notes:

[1] CRC is the fraction of the total cargo volume shipped that was carried by conference members.

[2] The figures in brackets are the number of exits which were from conferences.

[3] A hit and run entrant is defined as a line which entered for a period of one year or less.

[4] The relative size of the average entrant is computed as the average size of entrants in their first year of service (with size measured in terms of the volume of cargo lifted) divided by the average annual cargo volume lifted by incumbent lines.

[5] The relative size of the largest entrant equals the absolute size of the largest entrant divided by the average size of incumbent lines, with size computed as above.

[6] The figure measures the impact of entry in terms of "incumbent equivalents": thus a figure of 2.1 means that the cargo volumes captured by all entrants equals that lifted by 2.1 average incumbents.

Source: Compiled from the data base of the Water Transport Committee of the Canadian Transport Commission.

impact of entry appears to have been relatively small on the transatlantic trades though the table fails to capture the rapid rise of Cast Line over the period. This company had been in operation since 1970 primarily carrying bulk commodities from Europe to Montreal and the Great Lakes. However in 1976 it reorganized its services, chartered six container vessels, secured substantial base load through negotiating volume contracts and became a principal player on the East Coast Canada/Continental Europe outbound and inbound trades.[22] Cast, then, was not strictly an entrant but a revamped incumbent, though the willingness and ability of an incumbent to expand is surely influenced by the same factors which make for ease of entry - the satisfaction of the a priori conditions for contestability.

Although large scale entry may not be a universal phenomenon in Table 3.3 hit and run entry was: all the trades reported at least one case of a line entering and leaving within a single year. Finally, Table 3.3 confirms the global conclusion that exit from conferences has been significant and also shows that where the rate of entry and exit were roughly in balance, the conferences evidently managed to maintain their market share though when entry was substantially greater than exit, it clearly declined.

All the above analyses of entry and exit have been done on the basis of the service not the company. Consequently neither entry nor exit necessarily imply the creation or extinction of a company. The movement of vessels by a firm from one trade to another must give rise to the exit and entry of a service - something which in itself will influence the competitive environment in each trade - but it may not alter the total

Table 3.4

An Analysis of Corporate Turnover in the Canadian Liner Shipping Industry, 1977-82

Number of Liner Companies Operating in 1977	Number of Liner Companies Operating in 1982	Number of firms entering	Number of firms leaving	Hit and Run Entries	
				1 year or less	2 years or less
75	86[1,2]	60[3]	49[4]	13	6

Notes:

[1] The number of companies present in mid 1978 was 91.

[2] Over the period 1977-82 48 companies provided continuous or near continuous services: of the number 39 were conference members over all or a significant part of the period, the remaining 9 operating primarily as independents (ie. non-conference).

[3] Eleven entrants commenced service as conference members, 4 other firms initiated services as independents but subsequently joined conferences, while 45 started and remained outside conferences.

[4] Six of the companies which ceased to operate did not disappear completely: they either merged with, or else were taken over by other lines

Source: Compiled from data in Abbott, R., Mockus, Z., and Farinaccio, N., "The Supply of Liner Shipping to Canada," Canadian Transport Commission, Ottawa/Hull, 1984. The data in this report were derived from the Directory of Ocean Shipping Services, compiled and continuously updated by the Canadian government's Department of Industry, Trade and Commerce and from trade publications.

number of companies involved in the wider market environment. Table 3.4 shows the turnover of companies supplying liner services on Canadian trades but again the same problems arise: a company that is new to Canada may not be new to the rest of the world and an exit from Canada might imply not a death but a movement to a non-Canadian route. Indeed of the 49 exits listed in Table 3.4 only 6 were consequential on the complete bankruptcy of the company involved, the remainder being accomplished through service movement or in the case of a further 6, through take over or merger.[23] Similarly almost all the 60 firms which were new to the Canadian trades over the period were not newly established but existing foreign corporations that were redeploying their tonnage, presumably in response to perceived profit opportunities. Table 3.4 also shows that a significant number of companies were hit and run operators within the context of the Canadian trades as a whole, as opposed to specific Canadian trades such as described in Table 3.3. In general then, while the above data say nothing about the ease or difficulty of starting a new shipping line from scratch, they indicate very convincingly the ease with which capital can be moved from market to market, something in turn, which suggests that the pool of potential entrants from which any particular market can draw is very large indeed.[24].

It should be noted that the validity of all the above data, and conclusions drawn therefrom is likely to reach beyond the Canadian trades and extend generally to commercial liner shipping for the following reasons. Firstly, the data was drawn from 73 different trades which varied considerably in both length, volume and commodity composition.

Secondly, the industry is international so that an entrant on any Canadian trade must also be an entrant on the trade of the country at the other end and therefore the picture the data present is not bound to a uniquely Canadian context. Thirdly, some Canadian trades are served jointly with the U.S. and therefore some entry and exit will also apply to the U.S. market. Finally, the circumstances that allowed the satisfaction of the a priori conditions for contestability are general to liner shipping operating under all commercially orientated regimes.

It thus has been shown that the theory of contestability has found some supporting facts in the liner shipping industry. With an operating technology that demands few sunk costs and with a business environment which satisfies the price sustainability and symmetrical treatment of entrants conditions, the morphology of the industry closely matches the a priori requirements of contestability. And despite the short time period of the analysis, the empirical manifestations implied by these conditions were confirmed in Canadian liner trades. Entry and exit was frequent, hit and run entry common, very large scale entry was present and the quantitative impact of entry generally was often very substantial. When one matches these findings with the commonly reported low profitability of the industry [25] then surely we have some fine examples of entry nullified dominant firms and cartels, or, more generally, of markets which perhaps as far as is practically possible, approach the requirements of perfect contestability. Thus far from being a theorist's toy, the concept of contestability, for the maritime economist at least, appears an eminently relevant analytical tool.

Given these findings it would be tempting at this point to expound upon their behavioural implications in terms of optimal efficiency etc. To do so, however, would be to assume that the industry is not subject to any problems associated with an unsustainable equilibrium. The likelihood of this, however, will be examined more fully in Chapter 4. For the moment, the standard implications of operating in a highly contestable market such as the liner shipping industry appears to be may be summarised as follows:

1. Firms and associations of firms to survive will have to operate efficiently. Appropriate capital and organisation is hence demanded as is appropriate utilisation of capital and organisational infrastructure. Poor cost control, or 'x-inefficiency', will be impossible to sustain in the long run. More generally, the allocation of resources in the industry will be efficient. The basic impossibility of prolonged inefficiency also suggests that the longevity of the conference system is no accident, that it must confer some survival value and be doing something positive to promote general cost efficiency.

2. The need for survival will necessitate the most prepotent corporate objective to be long run profit maximisation. Previously in the literature Heaver had suggested that sales maximisation appeared to be the practice [26] while Sturmey contended that it was impossible to discern any systematic objective of conference behaviour.[27] It will subsequently be argued in this study that a conference's pricing behaviour can be understood as a response to the challenges of profit, survival and the associated need to deter entry and thus these previous hypotheses would appear somewhat fallacious.

3.3 Production and Cost Characteristics in Liner Shipping

As mentioned previously, in the analysis of pricing equilibria in contestable markets the two most relevant cost measures are economies of scope and product specific economies of scale. The estimation of the quantitative incidence of these measures is as yet unexplored territory in maritime economics. The magnitude of the task also renders it outside the scope of a study of this nature. However, the competitive environment of the industry allows reasonable inferential statements to be made concerning their prevalence. Prior to that however, it will be instructive briefly to review the implications of such cost studies that have been done on analysis by way of contestability precepts.

Perhaps, the most important implication of the seemingly contestable liner shipping industry relates to its efficiency predictions. In this respect Devanney in 1975 [28] conducted a simulated study of the efficiency of the West Coast of South America to U.S. route and concluded the opposite, that conferences promote inefficiency, with "...the annual cost to the world of the inefficiencies directly attributable to the cartelisation of liner services on this route averages close to $20 per ton or $40 million per year."[29] This study was made with reference to conventional liner shipping and therefore the difference between the most and the least efficient operator would be much greater than under today's containerised services where standardisation of equipment reduces the possibilities for this. The study was also widely criticised in that it assumed that port (time) costs were not a function of the quantity of cargo lifted.[30]

A similar though more recent simulated study of allocative efficiency of the conference system has been conducted by Zerby and Conlon in respect of containerised services from Australia to Europe.[31] Their findings indicated that "a greater amount of price and service competition among liner operators may result in welfare gains but in none of the cases analysed is the gain likely to be substantial."[32]

The above study was conducted on the Australia/Europe trades which are highly rationalised. In trades where the degree of rationalisation has been much less, such as in the open conferences serving the U.S.A., such simulations as have been done have tended to conclude the opposite, namely that costs could be reduced substantially through the rationalisation of services that the closed conference system often provides.[33]

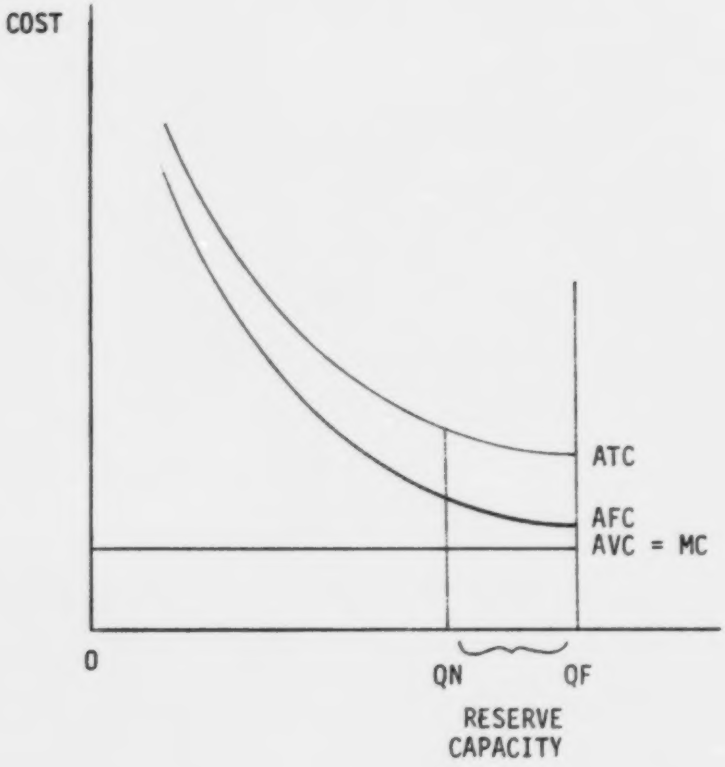
The problem generally with simulated cost studies is that although they all, quite properly, associate efficiency with high load factors, they incorporate within them merely a caricature of reality that may not accommodate some of the practical operational and institutional constraints which often impinge upon utilisation rates. In this way they may compare the actual with the unattainable. Moreover, in terms of their prescriptive content, the ways by which it is assessed that efficiency and load factor may be improved, usually by more competition or more rationalisation, is often indicative of a prior position regarding how both of these may actually work in the industry. To date, then, simulations appear to provide no accurate test of the efficiency predictions of contestable market theory.

Turning now to studies which have analysed the nature and structure of costs in liner shipping, these, to date, have all been based on the simplifying assumption that the output produced is a single product (namely TEUs per period). They can, of course,thereby give no indication of the possible extent of economies of scope or product specific economies of scale. Despite that they do provide both an indication of the effects of vessel size on costs per TEU and also of constraints that may impinge on the efficient utilisation of capacity in the short run.

With respect to the latter, contestable market theory, as noted in Chapter 2, has very little to say about costs in the short run other than the supposition that utilisation will be optimal, an inference stemming from the efficiency mandate. But what is optimal utilisation in the short run? It is generally regarded that in liner shipping short run costs per TEU fall continuously with increasing utilisation, until full capacity [34] and therefore that efficiency is a direct function of load factors. (See Figure 3.1). While this, no doubt is generally true, the need to supply a service to customers may sometimes require a margin of capacity to be held as reserve, to accommodate eg. normal fluctuations in demand. Both the necessity and magnitude of this requirement, however, is bound to depend on the specific circumstances of each trade. The implication then, is that although the efficiency requirement of a contestable market requires high load factors this does not necessarily mean 100% load factors. This, in turn, would mean that it may be difficult to test efficiency simply through measuring load factors without some prior knowledge of what the appropriate margin for reserve, if any, may be. Under present trading circumstances, however, with oversupply being a persistent problem on many routes, it is likely that actual load factors will be considerably below the reserve included optimal in which case absolute load factors would be directly indicative of relative efficiency. This of course would allow an estimation of the comparative efficiency of different lines on the same route which is important because in a contestable market all firms should be similar for none should be able to survive a prolonged period of relative inefficiency. Although time series data on individual firm load factors are thus very important in testing the efficiency implications of contestable market theory, they are, unfortunately, one of the most difficult items of data to obtain.

FIGURE 3.1

The Relationship Between Capacity Utilisation and Costs



OUTPUT (capacity utilisation)

One final comment on short run costs concerns the relatively high proportion of costs, perhaps 70% of the total,[35] that are fixed. These costs, when coupled with relatively low and constant unit variable costs bring about the cost configuration illustrated in Figure 3.1. This structure is noteworthy for two reasons. Firstly, the large fixed cost component means that it is difficult to allocate costs specifically to each cargo type: in contrast, they are costs which are common to all cargoes that are lifted. Secondly, the declining cost structure, with AVC = MC being at all output levels less than ATC, means that setting price equal to SRMC will not be financially compensatory. Both of these conditions have implications for pricing equilibria, as will subsequently be discussed.

Turning now to costs in the long run, all costs will of course be variable. This does not, however, mean that they can be separately ascribed to specific cargoes for most costs are a function of the passage of time rather than of the lifting of particular categories of cargo. Thus salaries, interest and property taxes are generally incurred by the month, charter hire is normally expressed as a per day rate while certain types of rentals, leases and insurance are paid on a yearly basis. Thus as in the short run, all costs other than those directly associated with cargo handling are common costs which somehow will have to be recouped by an appropriate pricing and output strategy.

With respect to economies of scale in vessel size it is generally agreed that whereas costs per ton of cargo transported at sea tend to decline with vessel size, port costs tend to rise with size. Given the current state of cargo handling technology it is consequently possible through a balancing of these forces to identify for a particular trade an optimally sized vessel, and assuming output to be expanding by the addition of extra optimally sized vessels, long run average costs should be constant. Studies relating to conventional shipping certainly have reported this to be the case.[36] The case of container shipping, however, is more uncertain. In 1977 Gilman et al [37] reported that on the North Atlantic economies of scale existed for vessels up to 4-5000 TEU (much larger than anything then or now operating). Laing,[38], however, analysing the Europe-Australia trade found economies of scale to extend only up to 1500 TEU sized vessels with larger vessels becoming progressively higher cost. A similar conclusion in respect of the same trade has also recently been derived by Zerby and Conlon.[39]

The implication of the latter two studies, then, is that when the output of liner shipping is viewed as a single product (TEUs) the extent of scale economies in container shipping is likely to be a function of the specific circumstances of each trade. In some, like the Australia case, it is possible that lines are employing vessels exceeding the cost minimising size, while on other trades the cost minimising size may yet to have been reached.

Let us consider now the extent of multiproduct economies of scale in the industry. Quite clearly the rigorous analysis of the extent of both economies of scope and product specific economies of scale requires the estimation of an appropriate multiproduct cost function. In the context of Canadian trades, however, the estimation of such is very difficult indeed given that the outputs - the different cargo types - supplied are normally supplied both to Canadian and U.S. ports. Data unfortunately is not available on the cargo types and quantities unloaded in U.S. ports after or before Canadian services commence. Consequently estimates based on Canadian data alone would grossly distort actual input output relationships.

Despite this problem it is nevertheless possible to make reasonable inferences on the extent of economies of scope simply from the general characteristics of the industry. In this respect, it should be noted that Baumol et al judge the principal source of economies of scope to be the existence of 'public inputs', namely inputs which once they are acquired for use in producing one good, become available automatically and costlessly for use in the production of others.[40] Of course it is the existence of such public inputs which gives rise to the common costs so prevalent in liner shipping, as mentioned above. The significance of public inputs and the common costs they generate is that the efficient use of capacity requires the production (or carriage) not of one product, that could utilise only a tiny fraction of the available capacity of a technically efficient unit, but of a variety of products so as to spread total costs over as great a range of output as is possible.

It is important to note at this point that in all perfectly competitive markets other than natural monopoly the existence of economies of scope will guarantee the existence of multiproduct firms [41] and by symmetry, the existence of the latter will imply the presence of the former. Now in the evidently highly contestable Canadian liner industry the combination of substantial common costs and the patent multiproduct nature of the output produced - as is evident from a glance at a ship's manifest - together testify to the likely existence of a high degree of economies of scope.

With respect to the significance of product specific economies, it is not so easy to draw such strong inferences. However, the revealed growth of the neobulk sector, which includes such products as automobiles, chemicals, ore concentrates, forest products etc., and the consequential transferring of the carriage of these commodities from traditional liner services to specialist carriers, is indirect evidence of the existence of product specific economies of scale in the servicing of these commodities. Remember that in a highly contestable market, revealed and maintained trends must be symptomatic of efficiency and therefore the emergence of specialist neobulk services could not have proceeded unless it was conducive to further cost efficiency. By similar reasoning, the collective provision of services to traditional liner cargoes, as opposed to specialist provision, is testament to the absence of significant product specific scale economies in these products.

Before leaving multiproduct cost implications, it is interesting to note that the existence of strong economies of scope can be sufficient to confer scale economies on an entire product set even if there are constant or some degree of decreasing product specific returns to scale on individual products.[42][43] To illustrate, if capacity was normally underutilised, substantial economies of scope must be present since separate services would require a (more costly) duplication of capacity. Moreover, the existence of unused capacity would also mean economies could be reaped by lifting additional quantities of specific product types (ie. product specific economies) or a larger quantum of the current product mix (ie. ray economies) since it would allow the further spreading of total (common) costs.

If unused capacity normally exists, then, it will serve to shape the nature and extent of multiproduct economies of scale and therefore have potential implications for the pricing equilibrium of the industry.

3.4 Market Structure and Pricing Equilibrium

It was noted in the previous Chapter that contestable market theory isolates only two types of market structure relevant for pricing, natural monopoly and everything else. In terms of the revealed structure of Canadian liner trades, the industry does not appear monopolistic. Thus in 1979 there was an average of six services operating on each route and in many cases the number was much larger, reaching 21 in the case of the Pacific Westbound Conference. Moroever, only on 8 of the 73 liner trades to and from Canada was there but one service, and these trades, invariably, were very small.

In general, then, it seems that the relevant structure for pricing in Canadian trades is the 'other than monopoly structure.' Now if this is indeed the case, and assuming the industry to be highly contestable, the pricing equilibrium, should be materially indistinguishable from perfect competition, with firms being driven by the threat of new entry competition to operate with optimal efficiency, to price each service according to its respective marginal costs and to realise only normal profits.

With respect to profits, it has since the time of the Rochdale Report [44] generally been assumed that profitability in liner shipping has been low.[45] This finding was recently reconfirmed by Heaver who reviewed the profitability of eight liner companies over the period 1965-80 and concluded "...that the rate of return served by the shipping companies studied here has, on average, been less than adequate....There is no evidence in the analysis that conferences aid liner companies to earn above normal rates of return."[46] The profitability implications of the theory thus would appear to be upheld.[47]

In the case of pricing, however, the implications of the theory appear much more difficult to sustain. In particular there is the problem of reconciling the observed, manifestly discriminatory rate structure of conferences with marginal cost pricing and the concomitant absence of intra-tariff cross subsidisation this necessarily will entail. Zerby and Conlon [48] have recently attempted to resolve this paradox by studying the structure of liner freight rates on the basis of hedonic pricing equations that explicitly ascribe to each cargo type "implicit marginal costs" which are estimated to be generated by their individual product characteristics and service requirements and then use these as the benchmark by which to assess cross subsidisation. When these "implicit marginal costs" are compared with actual freight rates the extent of cross subsidisation is much less than when done by conventional means having a single marginal cost benchmark.

While no doubt different commodities with different stowage characteristics and densities and possibly different service requirements can potentially impose upon carriers differing marginal costs one must be careful not to push the logic too far. After all given that most of a liner operator's total costs are common costs, even in the long run, any cargo specific costs must consist principally of cargo handling costs, which in the container age, are unlikely to differ between commodities substantially.

A perhaps more plausible explanation arises out of pricing constraints imposed by the presence of common costs themselves, costs which in relative magnitude are far more significant than any cargo specific costs. Now when producers in an industry are burdened with substantial common costs a situation closely resembling increasing returns to scale is created.[49] Thus just as the latter condition renders marginal cost pricing financially unviable since at all output levels marginal cost is less than average cost, so too does the former since identifiable incremental costs will of necessity be less than any measure of average costs which would have to include a premium for common overheads. Setting prices equal to the cargo specific (or marginal) costs generated by each service supplied would thus force firms to incur losses.

The basic problem facing carriers, then, is to discern a set of prices that both covers cargo specific costs and appropriately distributes common overhead costs. From the carrier's point of view the appropriate policy would be one which maximised the net profit contribution of each commodity or, expressed differently, which maximised each commodity's contribution to common overhead costs. In an unconstrained profit setting this would obviously occur when each service is priced such that $MC = MR$ and assuming MC to be similar among commodities, this would imply that prices are a direct function of MR or an inverse function of elasticity of demand.[50]

From society's point of view, the appropriate pricing policy would be one which allowed the carrier to break even but which involved the least possible sacrifice on the part of shippers, something achieved when the excess of rates over MC is in some inverse proportion to elasticities of demand so as minimally to distort the pattern of demand that would have been forthcoming of a first best, $P = MC$, pricing policy could have been adopted. The appropriate proportion would be whatever is necessary to allow the unsubsidised operation of carriers at the break even level. This pricing policy, is, of course, the Ramsey rule for second best Pareto optimal prices.[51]

The policy which is optimal for the carrier is evidently very similar to that which is best for society, the only difference being that a break even constraint is incorporated in the latter. However, assuming the liner shipping market to be highly contestable, a similar constraint would be imposed by market forces upon carriers. Thus it appears that the pursuit of profit - the objective of the carrier - may lead to the adoption of Ramsey optimal prices - the objective of society - a notion similar to the "weak invisible hand theorem" of Baumol, Panzar and Willig.[52]

A positive implication of such pricing would be a differential or discriminatory tariff with freight rates varying inversely with elasticity of demand. This has of course been a traditionally observed characteristic of conference pricing policies.[53]

It seems, then, that we have a plausible way of reconciling the evidently non-monopoly structure of the liner industry with its apparently monopolistic type pricing policy. The presence of substantial common costs prevents marginal cost pricing as it imposes financial constraints similar to those of the traditional natural monopoly problem. Carriers respond with value of service pricing - which causes freight rates to vary inversely with the strength, or elasticity, of demand - which in conjunction with their highly contestable market environment leads to the adoption of Ramsey optimal prices.

There is, however, a further complicating problem. There is no guarantee that Ramsey prices and their consequential discriminatory structure are sustainable against entry.[54] If they are not then the Ramsey structure will necessarily decay. The possibilities of this, however, will be discussed at length in the following Chapter.

3.5 Conclusion

The Canadian liner industry is evidently highly contestable having a history of frequent and qualitatively significant entry and exit. Its expected profitability level is consequently normal. The high level of common costs creates substantial economies of scope which makes multi-product services a necessity. The common cost problem renders the pricing of those services at marginal cost financially unviable and therefore carriers may be forced to adopt Ramsey prices. These prices, and some of the general optimal efficiency implications of a highly contestable market may, however, break down if a pricing equilibrium proves to be unsustainable. This will constitute the subject matter of Chapter 4, following.

Notes and References

[1] See eg. Gardner, B.M., "An Alternative Model of Price Determination in the Liner Shipping Industry," Maritime Policy and Management, Volume 5, No. 3, 1978.

[2] See eg. Bennathan, E. and Walters, A.A., "The Economics of Ocean Freight Rates," (Praeger, New York, 1969); Larner, R., "Public Policy in the Ocean Freight Industry" contained in "Promoting Competition in Regulated Markets," (Brookings, 1975); and U.S. Department of Justice (D.O.J.), "The Regulated Ocean Shipping Industry," (Washington, D.C. 1977).

[3] D.O.J., ibid., pp. 74-75.

[4] Gardner, op.cit., p. 199N.

[5] Shepherd, W.G. (1984) Discussion of "Concentration and Winning Bids in Auctions," The Antitrust Bulletin, Spring 1984, p. 89.

[6] Shepherd, W.G. (1984) "Contestability vs. Competition," American Economic Review, Volume 74, No. 4, p. 579.

[7] The trade press is replete with sources of information on the world's shipyards and their specialities (see eg. the "Directory of Shipowners, Shipbuilders and Marine Engineers," 80th Edition, Taylor and Francis 1982) while Lloyd's Register provides public information on the vessel characteristics, including place of construction, for all merchant ships engaged in international seaborne trade throughout the world. Lloyd's Shipping Economist also periodically published information on the construction subsidies, loans and aids available in the shipyards of different countries: eg. Volumes 3, No. 5, May 1981, page 16).

[8] See "International Rules for the Carriage of Goods by Sea" Transport Canada, December 1984.

[9] These legal and political issues are discussed much more fully in Chapters 4 and 5.

[10] Zahradnitzky, G., (1982) "Cargo Sharing and Recent Patterns in Canadian Trade" contained in "Canadian Perspectives on the UNCTAD Code of Conduct for Liner Conferences," (Government of Canada).

[11] Davies, J.E. (1983) "An Analysis of Cost and Supply Conditions in the Liner Shipping Industry," Journal of Industrial Economics, Volume 31, No. 4, pp. 417-435.

[12] Information on the state of the second hand market for vessels is also widely available through the trade press; see eg. Lloyd's Shipping Economist.

[13] Davies, J.E. op.cit.

[14] Conlon, R.M. and Zerby, J.A. (1983): "Public Policy in the Liner Shipping Industry," Centre for Applied Economic Research, Paper No. 20, University of New South Wales, p. 10.

[15] Seatrade, September 21-27, 1984, page 9.

[16] CAST in the North Atlantic and FESCO in the Pacific trades both achieved early rapid competitive success through negotiating volume contracts with large shippers.

[17] There is only one way shipping space can be sold, ie. through an actual negotiation between the seller and buyer (or buyers' representative). This inevitably results in either a formal time/volume contract, as noted above, or else a looser arrangement by which the shipper will agree to give the cargo subject to a price/service guarantee by the line. The generality of this practice was confirmed through interviews with the principal lines serving Canadian trade, the Canadian Shippers' Council and Mary Brooks - a specialist in the marketing of liner services.

[18] Baumol, W.J., Panzar, J.C. and Willig, R.D., "Contestable Markets and the Theory of Industry Structure," (Harcourt, Brace Jovanovich, New York, 1982), p. 466.

[19] Baumol, W.J.,"Contestable Markets: An Uprising in the Theory of Industry Structure," American Economic Review, Volume 2, No. 1, 1982, p. 14.

[20] Davies, J.E., "Pricing in the Liner Shipping Industry: A Survey of Conceptual Models," Canadian Transport Commission, No. 1983/04E, Ottawa/Hull, January 1984.

[21] In the case of the West Coast Canada/China, Japan, N/S Korea and Pacific USSR route, the largest entrant carried nearly six times the volume of cargo of the largest conference line (the biggest incumbents were non-conference) and two other entrants each lifted more than 3 1/2 times the volume of the latter, all, it should be remembered in their first year of service! For confidentality reasons corporate identity cannot be matched against volume figures. Although Statistics Canada lists these entrants as liner operators it is evident through the trade press that they carry bulk cargo too, thus inflating the volume figures. But that notwithstanding the entry of such lines can hardly be described as anything other than large scale.

[22] See eg. "CAST North America on a Roller Coaster," Transport 2000, July/August 1983.

[23] Abbott, R. Mockus, Z., Farinaccio, N. (1984) "The Supply of Liner Shipping to Canada," (Canadian Transport Commission, Ottawa/Hull).

[24] The above described satisfaction of the a priori conditions of contestability suggests, however, that starting a new line from scratch would be relatively riskless and therefore easy.

[25] See note [ ] infra.

[26] Heaver, T., "A Theory of Shipping Conference Pricing and Policies," *Maritime Studies and Management*, Volume 1, No. 1, 1973.

[27] Sturmey, S.G., "Economics of International Liner Services" contained in his "*Shipping Economics: Collected Papers*," (MacMillan, 1975).

[28] Devanney, J.W., Livanos, V.M. and Stewart, R.J., "Conference Ratemaking and the West Coast of South American," *Journal of Transport Economics and Policy*, Volume 9, 1975.

[29] Ibid., p. 176.

[30] Evans, J.J. notes that if such an omission was included in Devanney's calculation his computed cost of carriage would "practically double." See his Section D of "*Liner Shipping in the U.S. Trades*," *Maritime Policy and Management*, Volume 5, No. 3, 1978, p. 242.

[31] Zerby, J.A. and Conlon, R.M., "Cost Estimates of Simulated Changes in Liner Shipping Services," contained in "Forum Papers" of the Eighth Australian Transport Research Forum, Canberra 18-20 May 1983.

[32] Ibid., p. 250.

[33] See eg. the simulated study conducted by Hapag Lloyd, "*The Organisation of Liner Shipping In The Container Age Illustrated By The North Atlantic Trade*," 1977, and Gilman, S., Maggs, R.P., and Ryder, S.C., "*Containers on the North Atlantic*," Marine Transport Centre, University of Liverpool, 1977, p. 11 and pp. 99-105.

[34] For empirical evidence of this see Davies, J.E., "An Analysis of Cost and Supply Conditions in the Liner Shipping Industry," *Journal of Industrial Economics*, Volume 31, June 1983, and Ellsworth, R.A., "Competition or Rationalisation in the Liner Industry," *Journal of Maritime Law and Commerce*, Volume 10, No. 4, 1979.

[35] Davies, ibid.

[36] See eg. Deakin, B.M. and Seward, T., "*Shipping Conferences: A Study of their Origin, Development and Economic Practices*," (Cambridge University Press, 1973), and Jansson, J.O. and Schneerson, D., Economies of Scale in General Cargo Ships," *Review of Economics and Statistics*, May 1978.

[37] Gilman et al, op.cit.

[38] Laing, E.T., "*Containers and their Competitors: the Economics of Deep Sea General Cargo Shipping in the 1970's*," Marine Transport Centre, University of Liverpool, 1975.

[39] Zerby and Conlon, op.cit.

[40] Baumol et al, op.cit. pp. 75-79.

[41] Ibid. p. 249.

[42] Strong economies of scope may confer ray economies of scale too.

[43] Bailey, E.E. and Friedlaender, A.F., "Market Structure and Multiproduct Industries," *Journal of Economic Literature*, Volume 20, September 1982, p. 1032.

[44] "*Report of the Committee of Inquiry into Shipping*," (Rochdale Report) H.M.S.O. London 1970, p. 336.

[45] Gardner, B.M., "*The Return on Investment in Liner Shipping*," WP 20-84-07, Canadian Transport Commission, Ottawa/Hull, 1984.

[46] Heaver, T., "*Liner Conferences: Issues with Special Reference to Freight Rates*," Transport Canada, October 1982, p. 119.

[47] It should be noted that Gardner, op.cit., shows that the profitability of one line, OCL, improved after the introduction of containerisation.

[48] Zerby, J.A. and Conlon, R.M., "Joint Costs and Intra-Tariff Cross Subsidies: the Case of Liner Shipping," *Journal of Industrial Economics*, Volume 31, June 1983.

[49] Damus, S., "Two-Part Tariffs and Optimum Taxation: The Case of Railway Rates," *American Economic Review*, Volume 71, March 1981, p. 65.

[50] More precisely, in an unconstrained profit setting the relative deviation of price from MC will be inversely proportional to elasticity of demand because:

$$MR = P(1 - 1/E).$$

To maximise profits $MR_i = MC_i$

$$\therefore MC_i = P_i \; (1 - 1/E_i)$$

$$\therefore \frac{P_i - MC_i}{P_i} = \frac{1}{E_i}$$

[51] Mathematically the Ramsey rule can be expressed as

$$\frac{P_i - MC_i}{P_i} = \frac{1 + \lambda}{\lambda} \cdot \frac{1}{E_i}$$, where λ approximates the social

disutility consequent on allowing an extra dollar's profit to the firm. This is required in order to impose a break even constraint on the firm. See, Baumol, W.J. and Bradford, D.E., "Optimal Departures from Marginal Cost Pricing," American Economic Review, Volume 60, 1970.

[52] Baumol et al, op.cit. pp. 208-217.

[53] See eg. Chinitz, B., "An Analysis of Ocean Liner Freight Rates," Econometrica, Volume 24, 1950; and Bryan, I., "Regression Analysis of Ocean Liner Freight Rates," Journal of Transport Economics and Policy, May 1974.

[54] Baumol et al, op.cit. in their 'weak invisible hand theorem' employed cost assumptions which guaranteed that the Ramsey point would be sustainable. Under different cost assumptions, however, the Ramsey point may not be sustainable.

Chapter 4

On the Sources And Implications of Unsustainability

4.1 Introduction

At the end of the previous Chapter it was suggested that given the preponderance of common costs in the industry's cost structure, the natural response of firms will be a pricing policy designed to maximise each cargo's contribution to overheads and profit, a policy which will cause the prices of indiviudal cargoes to vary inversely with the strength or elasticity of demand. It was also noted that empirical studies of conferences' rate structures in the days of break bulk and early container services confirmed this to be the case. Recent research, however, suggests that this no longer appears to be true, that the previously observed, direct relationship between cargo value and freight rates has broken down.[1] Now no firm, or association of firms, will willingly abandon a profit maximising rate policy unless forced by external conditions. Consequently the decay of the Ramsey rate structure suggests that it is unsustainable given the nature of competition in the liner industry. Moreover, and of probably much greater consequence, the chronic instability and perpetual rate wars that have been experienced on many of Canada's and the world's principal trade routes, especially since the container revolution,is itself potentially indicative of the presence of some unsustainability conditions. This sort of thing is just not supposed to happen according to traditional oligopoly models where the recognition of mutual interdependence is deemed to lead to a supply stable solution. It is one of the most interesting and controvertial endeavours of Baumol et al's theory to show just why this basic stability principle may be in error.

It will consequently be the purpose of the present Chapter to examine the nature and meaning of unsustainability, the specific conditions that may bring it about in the liner industry and also the implications it may have for both economic welfare and for the behaviour of firms.

4.2 The Sources of Unsustainability

A sustainable equilibrium is said to exist when a firm can discern a set of prices for its outputs that allows it to be financially viable and which simultaneously makes profitable entry impossible.[2] An unsustainable equilibrium, by extension, will exist when no set of prices can be found that allows the firm to cover its costs and which will render all entry unprofitable. Baumol et al isolates five prime sources of unsustainability though they admit their list is by no means exhaustive.[3] The sources they do identify are:

1. The existence of an obligation imposed upon incumbents to supply any quantities demanded at prevailing prices or any market or services not supplied by others, when no such obligation is imposed on entrants. This situation, which is often characteristic of public utility or common carrier services, will mean that entrant and incumbent will not be competing on symmetrical terms and that the latter, if forced to cross subsidise any unprofitable services it may be obliged to provide, could always be undercut by the former, operating without such obligations, even if it were just breaking even.
2. In oligopoly or more generally "other than monopoly markets" equilibrium demands both zero profits and P=MC. With U-shaped average cost curves

this coincidence of conditions can only be satisfied if the level of market demand happens fortuitously to be an integer multiple of the minimum point of each firms AC curve. If this is not the case, at least one firm will be unable to satisfy the equilibrium conditions thereby rendering impossible a common pricing equilibrium.

Related to this, if a natural monopoly can satisfy market demand only when producing in a region of increasing costs, it may be vulnerable to small scale entry, as described in Chapter 2.

3. A combination of relatively weak economies of scope and relatively strong product specific economies of scale may allow the specialist firm to undercut the full supplier even though the cost of supplying both together may be cheaper in the latter.
4. Unsustainability can also arise when capacity, subject to economies of scale in construction, is used to supply demand in two or more successive time periods as described earlier in Chapter 2.
5. Finally unsustainability may result from a variety of public policies that impose special restrictions on incumbents but not on entrants.

To these five sources of unsustainability one may also add several other conditions specific to the liner industry which may also contribute to its chronic instability. Firstly in the industry several different technologies with different cost characteristics compete in overlapping markets. Air, specialist product, bulk and traditional liner operators all offer services that for many cargoes are effective substitutes. And given their different cost characteristics there is no clear and common zero profit equilibrium to which the forces of contestability would work towards. Secondly, the liner industry has of late experienced technological change of unprecedented proportions and the competition between the old and the new and the recognition that what is current may be short lived create problems for the appropriate costing of capital and the appropriate depreciation component in pricing.

Consider now each of these potential sources of unsustainability in turn and the specific relevance they have for liner shipping.

4.2 (i) Service Obligations

Although liner services have often been described as being public utility type services[4] and similar in nature to common carriers, they are not under the law. Common carriers such as railways have a legal duty under common law to carry the goods of anyone who requires them to do so except where they are lawfully entitled to refuse (eg. on the grounds of safety). Shipping companies are treated as private not common carriers and are under no such obligations. Their legal position vis a vis shippers is laid down in the Canadian Carriage of Goods by Water Act (1936) which incorporates the 1924 Hague Rules which are commonly applied by trading nations to bring international concord in respect of the rights and liabilities of carriers and shippers.[5]

In terms of liner shipping those rules apply commonly to all shipowners and charterers: there is no differential treatment between conference and non conference members or between existing firms and entrants. The rules, moreover, address not so much service obligations as issues relating to the seawortheness of vessels, the particulars specified in bills of lading and the general care of cargo.[6] Consequently all carriers are free to choose which ports and routes they will service and which customers they will serve.

Under the Shipping Conferences Exemption Act (1979) an obligation of sorts is imposed upon conference lines in that an agreement to refuse to transport cargo of a shipper who previously used a non-conference carrier would render them subject to investigation, conviction and fines under the Combines Act. This provision, however, simply ensures equality of treatment of shippers by conference and non-conference lines alike.

In general, then, under Canadian law all carriers are treated evenly and no obligations are imposed upon existing carriers - conference members or otherwise - that are not simultaneously imposed upon entrants.

The same is not true, however, in the wider international context of the industry where governmental restrictions may actually or potentially offer favour or discrimination to different carriers. The UNCTAD Code of Conduct is a case in point. Article 15, for example, demands that "promotional freight rates for non-traditional exports should be instituted by conferences".[7] As the Code is supposed to apply only to conference and not non-conference lines differential treatment becomes a real possibility. In particular 'promotional' rates imply something less than the long run commercially viable rate and therefore their instigation will require some form of cross subsidy. This in turn would render the conferences rate structure unsustainable against incursions by non-conference lines which do not have to carry the loss generating promotional cargo. Of course promotional rates are supposed to be temporary but like many forms of subsidy, once granted they may be difficult to relinquish, especially if the country is not significantly involved in shipowning itself.

Similarly, Article 19 of the Code dealing with "adequacy of service" renders conference lines potentially subject to service obligations suggested by, amongst others, "appropriate authorities" (governments). Non-conference lines, being outside the scope of the Code would escape such obligations.

The above pictures are, of course, simply possibilities at the moment since it remains to be seen how the international community will implement the Code. The same cannot be said, however, about other nationally instigated policies that serve to discriminate between lines, the consequences of which are all too well known. In particular, the favouring of national flag shipping through overt subsidies or subsidies implicit in the tax system automatically alters the competitive relations between different flag lines and therefore renders a normal profit equilibrium established by the commercial or less subsidised operators unsustainable in the face of competition by the heavily subsidised. The classic case in point is the rise of Soviet shipping especially in the mid 1970's which has been accused of being heavily subsidised[8] and which had the effect of creating substantial instability on many trades.[9]

In like manner, any obligations imposed upon national shipping which serves to raise its costs, such as requirements to use only national labour, or a restriction on the choice of shipyard to those within its borders, will also serve to render the services of such lines unsustainable against entry from other flag lines subject to no such restrictions.

Returning to the singularly economic characteristics of the industry it is possible that a form of unsustainability similar in nature to the 'service obligations' genre may arise if the service provided by existing lines is fundamentally incompatible with that of entrants. In this respect the kind of service provided by conferences is typically long term in nature and as such it shares some of the characteristics of a telephone service in that the potential user has immediate access to it, whether he needs it or not. Now for the 'insurance value' of access to the phone service the potential user pays in the form of the fixed rental price but the potential shipper, in contrast, faces similar security of service but pays only when he actually utilises the service. From the carrier's point of view this means that many of the costs of his long term service are independent of use and therefore the charges for use must include payment for both direct costs and the independent service costs.

Operationally, this will mean that for a long term service to be financially viable the prices charged must be sufficient to recover both direct user costs and the insurance costs consequential on supplying access to the service. And as, unlike telephones, there is no way of recovering insurance or access costs from potential users, it is actual users that must bear the full costs. Consequently in liner shipping where private operators endeavour to supply a long term service, financial viability requires prices that in effect result in actual users cross subsidising potential users.

In a highly contestable market cross subsidies will always invite entry, as seen in Chapter 2 and therefore operators supplying a service where financial viability demands them will have no sustainable prices open to them, with chronic instability the result. The practical manifestation of this is the problem of pricing over seasonal or cyclical patterns of demand, of attempting to recoup losses consequent on maintaining services when demand was low through appropriate prices levied on users when demand was high.

What mitigates against this is, of course, the fact that entrants may arrive only when demand is high and, if supplying only a short term service, may have no previous losses to recoup and can therefore undercut the rates of the long term operators and jeopardise their viability.[10]

In liner shipping, then, unsustainability may arise in consequence of a fundamental incompatability between the services of long term operators - whose prices must include premia for both use and access - and the short term hit and run operator whose prices must recover only user costs. Expressed alternatively, the unsustainability may be attributable to market failure consequent on a missing market - the market for ensured access to liner services.

4.2 (ii) Oligopolistic Equilibrium and Monopoly and Small Scale Entry

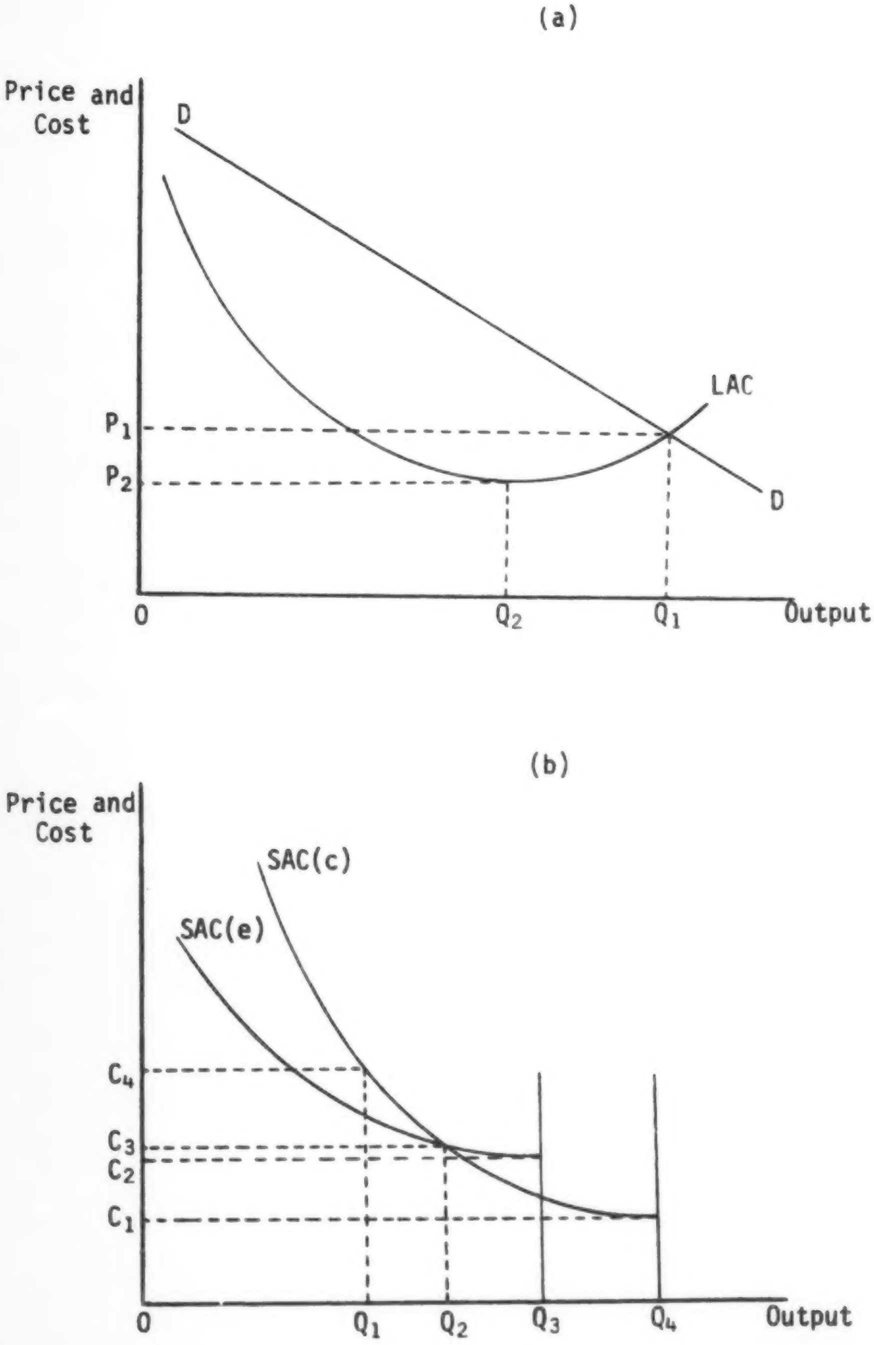
As noted above, the second potential source of unsustainability identified by Baumol et al arises out of the requirement of an oligopolistic equilibrium that $P = MC = AC$. Now with a traditional U-shaped AC curve this requires that the output quantum associated with the minimum point of the firm's AC curve - the only point where the above conditions can be satisfied - is exactly divisible into market demand. Although at first sight this seems an unlikely coincidence, Baumol has shown that when the LRAC curve is L-shaped or has a "flat bottomed" segment the equilibrium conditions will in fact normally apply.[11] Consequently the potential for unsustainability generated by the nature of an oligopolistic equilibrium appears more in the nature of a pathological curiosity than a genuine practical concern.

In contrast, the vulnerability of monopolists to small scale entry, when the former can satisfy market demand only by producing in a region of diseconomies of scale, does have important lessons for the liner industry. In this respect, Baumol et al's, argument can be illustrated simply as in Figure 4.1(a). In the diagram LAC represents the monopolist's long run average cost curve and it is drawn so as to exhibit diseconomies of scale at the margin. The market demand curve is DD and by assumption it can be supplied most cheaply by a single firm monopolist producing at an output of OQ_1 and a price of OP_1. Now although the entire market may be supplied most cheaply by the single firm it is impossible for it to keep out partial suppliers who are able to produce outputs such as OQ_2 at a price OP_2 that is less than the normal profit price of the monopolist supplying the whole market.

Given that the liner industry in terms of its revealed structure and long run cost characteristics would not normally qualify as a natural monopoly it may perhaps be somewhat heroic to attempt directly to interpret the above possibility in terms of the practice of the industry. But as a conceptual metaphor it does have practical lessons about the consequence of small scale entry which may be very relevant when different qualities of service are provided by full and partial suppliers. Now lines which endeavour to provide a full, across the board, general cargo service - as opposed to those which through eg. selective rate cutting, seek to specialise in a particular market segment - may sometimes have to incorporate into their service a margin of reserve capacity to accommodate normal variations in demand and to prevent damage to customer goodwill consequent on a persistent shortfall of available capacity. This, of course, is part of the service package provided generally by scheduled transport operators. The cost of providing this service feature, of holding a margin of capacity

FIGURE 4.1

Inefficient Entry and Unsustainability



for reserve, will of necessity elevate the unit costs of running capital in place and, in turn may render the full suppliers vulnerable to entry by partial suppliers. This is because the latter may be able to tailor their service to suit the needs of particular customers - as opposed to the general market - and may accordingly dispense with the need for reserve capacity, since by not attempting to serve the whole trade, they may operate consistently at very high load factors, throwing any variations in demand on to the conference to cope with.[12] This situation is illustrated diagrammatically in Figure 4.1(b).

In the diagram a conference's (or a representative full supplier's) short run average cost curve for a single vessel is shown by SAC(c) and it is assumed to be optimal for supplying the market as a whole. This means that the margin of reserve capacity supplied, say $OQ_4 - OQ_2$, is optimal given the nature of aggregate demand on the trade. The cost curve of an entrant is given by SAC(e) and it is assumed to employ smaller vessels than the conference. Consequently its full capacity costs are higher than those of the conference (ie. $C_2 > C_1$) and likewise its unit costs when supplying the same proportionate margin of reserve capacity, say $OQ_3 - OQ_1$, would also be higher (ie. $C_4 > C_3$). If, however, the entrant through specialising in a particular market and abandoning the service imperatives consequent on supplying the entire trade is able to operate at or near full capacity, it is in a position to undercut the conference assuming the latter remains committed to supplying the whole trade and is therefore in need of its current sized vessels operating with their requisite margin of reserve capacity. Thus through market niching it may profitably enter the market even though the incumbent conference, charging a normal profit price, can service the market as a whole at least cost, as the latter's prices would be unsustainable in the face of such entry.

4.2 (iii) Economies of Scope v. Product Specific Economies of Scale

Unsustainability can occur when "...economies of scope are insufficiently strong and economies of scale for individual substitute products are sufficiently strong that specialised firms can take advantage of favourable demand conditions despite the cost advantages of the multiproduct supplier."[13] Unfortunately Baumol et al do not sufficiently enlarge upon this statement so as to make it clear what its full logic and implications are. But in the field of liner shipping, a situation seemingly similar is encountered in the frequent overlap of the general cargo and neobulk markets.

As mentioned in Chapter 3, the revealed emergence of specialist neobulk carriers in a highly contestable market is indicative of the presence of product specific economies of scale. But the technology of the specialist carrier is such that it is not of necessity physically bound to the carriage of the cargo for which it was expressly commissioned. Thus Seaboard Shipping Services Ltd., operating between British Columbia and Japan, and in business primarily to service the shipping needs of its sister company Seaboard Lumber Sales Ltd., is able to ship out bulk lumber and return with Japanese cars.[14] Indeed, the possibility of combining bulk and container services is extremely attractive to bulk operators, especially those engaged in the shipping of low density cargo, as then even if below deck space be completely full and no specialist provision for container capacity exists, the latter may be carried as deck cargo. Moreover, if total service costs are covered by the carriage of bulk, it will be profitable to lift any boxes at any rate above the minimal marginal costs of cargo handling. This of course is bound to create problems for the specialist container operator who must cover his total and not just marginal costs.

In like manner, the marginal investment costs of some specialist container capacity on top of basic bulk capacity is also relatively small and this, when coupled with sufficient volume contracts, can provide the combined operator with a significant cost advantage over the specialist general cargo carrier. It was of course this strategy which lay behind the initial success of Cast on the North Atlantic and the recent rapid growth of Star Shipping on the Pacific.[15]

This advantage, however, is contingent upon an appropriately buoyant neobulk market to provide the requisite cost covering base load. If the bulk market was to turn soft, container cargo would have to be called upon to contribute to total costs and this might wipe out any advantages the combined carrier may have in moving containers. Indeed this was an important contributory cause of the financial difficulties of Cast in the early 1980's.

In essence, the above argument rests on the incremental cost advantage of the neobulk operator in carrying marginal container capacity in conjunction with a bulk base load. In part this does arise from the existence of product specific economies of scale, the force which allowed the initial emergence of the specialist carrier which in turn is simultaneously blessed with a fortuitous by-product in the form of an ability to carry container cargo at low incremental cost, and therefore it does approximately mirror Baumol et al's assertion. But in addition, the consequential instability may also be attributable to a competition between different technologies, something which will be enlarged on in Section 4.2(vi) below.

4.2 (iv) Intertemporal Unsustainability

As discussed at length in Chapter 2, intertemporal unsustainability occurs when a firm correctly anticipates that demand for his products or services are growing with time, and, realising that the construction of capital equipment is subject to economies of scale, builds capacity sufficient to service not just current demand but some demand in future time periods too. Although this may be the optimal, cost minimising strategy for servicing demand over the life of the constructed plant, the firm is nevertheless vulnerable to entry from smaller scale firms content merely to construct capacity adequate for current demand which thereby avoids the costs of holding resources idle in anticipation of future demand.

In terms of its prevalence, Baumol et al suggest intertemproal unsustainability to be close "...to being the rule rather than the exception"[16] though on the basis of which particular market structure it is most likely to be of consequence in there is some confusion. Thus Baumol et al simultaneously speak of, and formally prove their basic theorem, in terms of, an intertemporal natural monopoly[17] yet elsewhere talk of "incumbents"[18] and leap from considerations of the static welfare effects of "monopolistic and oligopolistic industries" to the dynamic implications of their pricing.[19] Certainly the tone of their work is strongly indicative that their analysis has wider generality than the natural monopoly structure.

In the case of liner shipping it is not unreasonable to argue that conditions analogous to intertemporal unsustainability are commonly present. New replacement tonnage since containerisation has on many routes progressively been of an increasing size. Thus U.S. Lines, hoping to operate a round the world service,have ordered fourteen 4,000 teu vessels, [20] while on the

North Atlantic Cast has progressively increased the size of its vessels from an initial 385 teu's in 1976 to, by 1982, a fleet of 70,000 dwt container/bulkers each having 1450 teu container capacity. It is also reported that both the Japanese lines and Sea-Land are due to replace their existing trans-Pacific fleets with vessels of up to 4,000 teu's, which, not being essential for the servicing of current demand, are likely to be substantially underutilised initially.[21] As the last case explicitly illustrates, much of the new jumbo capacity on order and coming into effect is in part anticipatory of future demand and, depending on the speed and the extent to which these anticipations may be realised, may therefore render their owners vulnerable to competition from smaller, higher utilised vessels. The intertemporal unsustainability analysis of Baumol et al certainly suggests that such carriers may be in for an uncertain future.

4.2 (v) Unsustainability through Public Policy

This compendium of potential sources of unsustainability is similar in nature to the case previously discussed in 4.2(i) with the added feature that the obligations imposed upon incumbents but not entrants issue from different public policy imperatives. As the discussion in Section 4.2(i) was broadened to include a variety of separate policy constraints which potentially result in differential treatment of carriers it would be superfluous to enlarge further on the subject at this juncture.

4.2 (vi) Unsustainability and Competition between Technologies

In all the unsustainability analysis of Baumol, Panzar and Willig it is assumed that the competition between incumbent and entrant is effected on the basis of similar technologies of production. When there is a difference between entrant and incumbent it is a difference in the scale of production not the technics of production: both plan their output strategies with reference to the same long run cost curves.

The situation in liner shipping is very different as carriers operating a variety of dissimilar technologies frequently compete for the same or for overlapping markets. The specialist container operator, the container/bulk combination carrier, the specialist bulker with containers on deck, the break-bulk operator, land bridge services and increasingly air transport may all frequently compete for the same customers. The same problem, though to a lesser degree, also occurs in the case of railways where it has been noted that Ramsey prices are unsustainable in the face of intermodal competition.[22]

The potential instability posed by a competition between technologies arises from two principal sources. Firstly, each type of carrier, operating as it does a different technology to that of its rivals, will face a different cost structure. In particular, break even load factors [23], the price floors corresponding to incremental costs, and the appropriate mark up to cover overheads and profit may all be different. Consequently there may be no set of prices that can yield an industry wide zero profit equilibrium.

Secondly, the principal target markets of each carrier may be different and this, in turn, has implications for what they may regard to be appropriate prices in secondary markets. The strong case would be the specialist bulker for which bulk cargo is obviously the primary market and deck container cargo a very secondary market. As noted in Section 4.2(iii), this implies that any price in excess of cargo handling costs is lucrative in that secondary market from the viewpoint of the bulker. However because this is simultaneously the principal market of the specialist container operator the viability of the latter is jeopardised whenever the incursions of the former become non-trivial in extent. And to a lesser degree, the same basic principle will hold in any competition between technologically different carriers as that technological differentiation is itself the result of a specialisation in different primary markets.

In the liner industry the existence of technologically disparate carriers renders the attainment of a stable pricing equilibrium difficult if not impossible. It also implies that cost efficiency is no guarantee of long run success in the liner market proper if the conditions of the trade permit substantial inroads by secondary operators.

4.2 (vii) Unsustainability and Changes in Technology

In terms of the technology of production the unsustainability analysis of Baumol et al is essentially static, even in the intertemporal setting, in that it does not admit of the possibility of change. Primarily this is because they perceive that "...increases in productivity induced by technological changes do not, inherently, constitute a threat to sustainability"[24] and therefore may be ignored.

In the specific context of the primary general cargo market it may not be so easy to dismiss its consequences. This is because the rate of technological change has been unprecedented in its recent history and, as in the days of steam and sail, has resulted in a fierce competition between the old and the new.[25] And for the following reasons this competition has no obvious stable outcome. Firstly the technical superiority of the new does not necessarily imply economic superiority over the old. For whereas the cost of bunkers, maintenance and insurance costs are normally substantially lower with new tonnage the capital costs of new technology vessels are so high that their total costs (capital plus operating) may exceed those of old vessels whose capital costs may be substantially or completely depreciated.[26] Secondly, because the rate of technological change has been so rapid of late it has become difficult to forecast the economic life of a new vessel and therefore to assess the appropriate period of time over which the capital costs of the vessel should be depreciated. Uncertainty warrants a shortening of the pay-back period [27] though this inevitably inflates annual capital charges and therefore makes it more difficult for the new to compete with the old. Alternatively, writing off capital charges over a longer period may result in insufficient capital cost recovery thereby constraining the ability of the shipowner to take advantage of future technological developments.

Finally, whilst the technological side of the industry has been changing fast and has allowed the development of new types of carriers (combined carriers etc) both of which have serious implications for costing, the revenue side of the pricing equation has typically responded much more slowly. In particular the conference system has seemed to mitigate against the rapid evolution of freight tariffs that is perhaps necessary if conference carriers are to be able to compete successfully against outsiders which may, as seen earlier, be operating a variety of different technologies. This was cited as the proximate cause of the October 31, 1984 dissolution of the Pacific Westbound Conference [28] and it may also be an important contributory cause of the surprisingly high rate of new entry witnessed recently in

Canadian trades, as described in Chapter 3.

Whether or not the above conditions constitute a legitimate form of unsustainability is really a matter of conjecture. Certainly the rapidity of technological change has made the appropriate costing of capital difficult and this in turn has implications for competitive success. With perfect information about likely technical developments and perfect ability to use that information such difficulties would not exist and therefore, as Baumol et al suggest, technological change in itself may be no threat to sustainability. But in a world of less than perfect human beings it would be somewhat optimistic to judge the consequence of this technical change as being of the nature of ordinary business risks. Its degree by previous standards is extraordinary and of itself may serve to render the attainment of a stable pricing equilibrium very difficult.

4.3 The Consequences of Unsustainability

The implications of unsustainability for economic welfare, as mentioned briefly in Chapter 2 are twofold. Firstly, the inability of the incumbent firm(s) to prevent "duplicative and wasteful competitive entry"[29] means that the revealed industrial structure is not necessarily the most efficient. In the face of conditions that promote unsustainability, a contestable market, admitting of free entry and exit, thus does not always guarantee social efficiency. Secondly, in the presence of unsustainability, it may be that the only way the incumbent can maintain stability for itself - and in the process provide for society the most cost efficient industrial structure - is to engage in responsive pricing and other strategic behaviour designed to kill off actual and to deter potential competition.[30] The practice of such behaviour has, of course, long been condemned as leading towards monopolistic abuses and for this reason Baumol et al judge its consequences to be more detrimental than the possible advantages flowing from the attainment of the stable efficient structure it may allow.

If responsive pricing is ruled out, government assistance may be required to help attain and maintain the efficient structure. Entry restrictions may be a possible remedy though this often leads to x-inefficiency on the part of the incumbent and again is not favoured as a general solution to unsustainability.[31] For similar reasons subsidies too are not recommended. The solution most favoured by Baumol et al is to impose upon entrants a symmetrical burden to that carried by incumbents in respect of obligation to serve the same markets and to pay the same prices for inputs.[32] This would eliminate some of the sources of unsustainability mentioned previously but in itself would not prevent the responsive pricing remedy available to the incumbent. To counter this, Baumol et al suggest a policy of "quasi-permanence of price reductions" whereby incumbents would be forced to maintain for a protracted period any price reduction they may introduce in the face of entry. This would prevent the incumbent from temporarily slashing prices to kill off entry and then again raising them following the demise of the latter.[33]

4.3 (i) An Alternative View of Baumol et al's Sustainability Analysis

In presenting the above body of ideas, Baumol et al essentially present a theoretical problem - the possibility of an unsustainable pricing equilibrium - they then deductively develop certain adverse implications the problem may have for social welfare in terms of allocative efficiency and the precipitation of undesirable corporate behaviour, and finally suggest certain policy measures to remedy the problem. The emphasis they place upon it, the remedial policies they prescribe and their assertion that under certain conditions it is likely to be the rule rather than the exception all suggest the problem to be very real and very general. However, other than a vague assertion that the U.S. Postal Service "seems to provide a striking example of this problem,"[34] (ie. unsustainability by weak economies of scope and strong product specific scale economies), an assertion that was on the same page tempered by noting that "...other models may more accurately describe this situation"[35], the authors provide not one real world example of unsustainability. Not surprisingly, the relevance of unsustainability has come to be doubted by some economists.

W.G. Shepherd in particular has been highly critical, suggesting Baumol et al's formal analyses either to be irrelevant or else simply to prove and in the process, trivialise the obvious.[36] In particular, he notes that the assumptions required in Baumol et al's analysis are both very extensive and very unlike the conditions encountered in industry generally. This is illustrated in Table 4.1. He also notes that while Baumol et al suggest an equilibrium either to be sustainable or unsustainable, in practice, if unsustainability does exist it would more likely be a matter of degree, confined to certain products or services and being of uncertain quantitative consequence. Thus policies targeted on an either or approach may in practice do more harm than good.

As an overall critique of the principle of unsustainability, Shepherd is nevertheless unconvincing, his paper containing perhaps more generalities than Baumol et al's. But the admitted uncertainty of the analysis of the latter [37] coupled with some reasonable criticisms of the former suggest that the issue is not sufficiently mature to warrant at this stage a substantial reshaping of conventional wisdom.

In addition to the general criticisms of sustainability offered by Shepherd, the analysis of Baumol et al especially as it relates to static unsustainability has also been attacked of late on conceptual grounds. This is especially true of their famous "weak invisible hand theorem."[38] This theorem stated that a natural monopolist will always choose Ramsey optimal prices because they are sustainable and can be discerned with less information than can other sustainable price vectors given certain cost and demand conditions. This theorem, however, is really very weak indeed because it can be shown that under many alternative patterns of demand and costs Ramsey prices may not be sustainable though at the same time this does not mean that the firm itself is unsustainable as often a range of alternative sustainable prices may be easily isolated.[39] In practice, this may mean that the simple decay of the Ramsey rate structure seemingly observable in liner shipping suggests only that that particular price structure is unsustainable not all price structures: there may be other prices and outputs that are sustainable against the type of competition experienced in the industry, though for this to be ascertained one must consider not simply prices and costs but the full range of potential sources of unsustainability listed above. On their own, then, extrapolations based upon the weak invisible hand theorem are next to useless.

Against this backcloth, what conclusions can one reasonably draw from the list of potential unsustainability conditions relevant to the liner industry previously described? Now the history of the industry reveals an

Table 4.1

Assumptions for BPW Sustainability Analysis

BPW Assumptions	Common Conditions in Real Sectors
I. Static Analysis	I. Static Analysis
1. Regulation is ideal. Regulators' information and powers are complete, and their actions impose ideal results without any friction or delay. The monopolist produces the socially ideal set of products, under regulation. The monopoly earns zero excess profits.	1. Actual regulation is usually imperfect, incomplete and lagged. The firm has wide dicretion in produce offerings. Profits are often well above zero.
2. Costs. For the single-product firm, there are large economies of scale. For multiple-product firms, there are high joint and overhead costs.	2. Cost conditions vary, in both scale economies and joint costs.
3. Reselling. All products can be freely resold among customers, so that only one price can be set by the monopolist for each product.	3. Reselling is usually not feasible, except for certain limited products. Price discrimination is usually possible.
4. Nature of the products. (1) No distinction is made between core and adjacent goods. All are treated as if they were core products. (2) The monopolist's and entrants' goods are identical items, no variation is permitted, either at the start or as events unfold. (3) The social value of goods is reflected only in demand conditions (including consumer surplus).	4. The products vary, both among core and adjacent services and between the established firm's produce and entrants' products. Social values often go beyond demand conditions.
5. Technology is transparent (both the existing conditions and possible future choices). It is as completely known and accessible to entrants as it is to the monopolist. The regulators also have complete knowledge of present and alternative future technologies.	5. Actual and alternative technologies are often complex and incompletely known to outsiders.
6. Frictions in adjustments: there are none. Changes are instantaneous.	6. Frictions and irreducible lags in adjustments are often large.
7. Barriers to entry: there are none (other than those created by scale economies or joint costs in the multiproduct case). Barriers to entry by low-cost firms can only be provided by actions of the regulators.	7. Barriers to entry are often large and have many sources.
8. Competitive advantages of the monopolist (in knowledge, financial ties, customer loyalty, experience, etc.): there are none.	8. The monopolist often has large advantages over entrants.
9. Responses or preemptive actions by the monopolist: there are none and the entrant expects none to be made (by the "Cournot-Nash' assumptions).	9. The monopolist typically responds sharply to new entry, and entrants usually expect retaliation by price cutting or other actions.
10. X-efficiency and innovation, the monopolist is expected to optimize them under perfect regulation	10. Monopoly effects on innovation often remain. Also, the side effects of regulation itself often raise costs and enlarge investment (the cost-plus and rate-base effects).
II. "Dynamic" Analysis. In addition to the ten static conditions.	II. "Dynamic" Analysis.
1. Construction costs are (1) large, relative to current costs and (2) have strong economies of scale (average cost declines steeply in the relevant range).	1. Construction costs vary but they are usually below 20 percent of current costs. Scale economies are often absent or moderate.
2. Construction occurs instantly, at the time selected. There are no lags, no duration of construction.	2. Construction usually is lengthy, with a duration of two to five years.
3. Strategic behavior is absent. There is no possibility of preannouncement, preemption, or other action designed to discourage entry or to influence its timing. (Cournot-Nash assumptions are extended to this context).	3. Strategic behavior can be sophisticated and strong.

Source: Shepherd, W.G., "Competition and Sustainability," in Deregulation Appraisal Before the Fact" (University of Michigan Press, 1982).

acknowledged propensity towards periodic intensive competition and certainly the above list suggests reasons why this may be the case in addition to the more traditional explanations of low variable costs and excess capacity.[40] Moreover, Baumol et al's inference that incumbents are likely spontaneously to seek a cure for the unsustainability problem by eg. engaging in responsive pricing, also has implications for liner shipping.

If the conference system as a whole can be interpreted as an attempt to stabilise competition between incumbents, in consquence, possibly of the traditional low variable costs problem, then the system of loyalty ties it operates may be regarded as an attempt to stabilise entry induced instability. In a similar vein, it is also possible that entry-induced instability may be mitigated if the incumbents could perhaps change the nature of the service so as to require of all firms an investment in sunk facilities as this would create an entry barrier thus making them less vulnerable to competitive entry.[41] **The possibilities of this, however, will be discussed in the following chapter.**

4.4 Conclusions

This chapter has endeavoured to assess whether the conditions promoting unsustainability identified by Baumol et al have a counterpart in the liner shipping industry. Unfortunately the unsustainability literature is undeveloped and it is not yet clear how potentially extensive and how relevant the concept may be. It was nevertheless possible to isolate a variety of conditions, similar to those postulated by Baumol et al, which may be likely sources of instability and which may help explain the frequent rate wars the industry experiences. The analysis of Baumol et al is thus useful, even in its present state in that it suggests that some monopolistic or oligopolistic markets may be perpetually unstable - in contrast to established theory - it identifies some reasonable sources of such instability and it also indicates that corporate behaviour is likely to evolve to accommodate such instability, in the form, eg. of responsive pricing, loyalty ties, or investing in sunk facilities. It is, however, doubtful whether the concepts of unsustainability are sufficiently developed to warrant the kind of remedial policy measures they suggest: it remains to be demonstrated whether or not such measures would produce better social welfare results than chronic instability or even whether their measures are practically feasible to implement.

Notes and References

[1] See e.g. V. Wei, Economic Analysis of the Liner Market and Freight Rates in Canadian International Trades, Canadian Transport Commission, Report No. 1985/05E, Ottawa/Hull, December 1985.

[2] Baumol, W.J., Panzar, J.C. and Willig, R.D., "Contestable Markets and the Theory of Industry Structure," (Harcourt Brace Jovanovich, New York, 1982), henceforth termed BPW, p. 192.

[3] Ibid., Chapter 16.

[4] See eg. Agman, R.S., "Competition, Rationalization, and United States Shipping Policy," Journal of Maritime Law and Commerce, Volume 8, No. 1, 1976, p. 9.

[5] For a review of the development of this legislation see "The Future of Canadian Carriage of Goods by Water Law," Dalhousie Ocean Studies Programme, Halifax, Nova Scotia, March 1982.

[6] Ibid.

[7] "United Nations Conference of Plenipotentiaries on a Code of Conduct for Liner Conferences, Volume II, Final Act, TD/Code/13/Add. 1, New York, 1975.

[8] See eg. "Soviet Shipping - A Seatrade Study, Seatrade, February 1976 and also "Russian Roulette," "The Shipbroker," April, 1981.

[9] "Eastern Invasion," The Economist, July 23, 1977 and "The World's Shipping Cartels Begin to Crumble," The Economist, July 19, 1975.

[10] Davies, J.E., Evans, J.J., Gardner, B.M. and Lowe, A.V., "Liner Shipping in the U.S. Trades," Maritime Policy and Management, Volume 5, No. 3, 1978, pp. 156-159.

[11] Baumol, W.J., "Contestable Markets: An Uprising in the Theory of Industry Structure," American Economic Review, March 1982, pp. 1-15.

[12] This phenomenom of new firms operating at less than optimal scale but at 100% utilisation, serving particular submarkets only and leaving established firms to cope with fluctuations in demand is in no way unique to liner shipping. Indeed it has been observed in many manufacturing industries; see eg. Brunner, E., "A Note on Potential Competition," Journal of Industrial Economics, Volume 9-10 (1961), p. 248.

[13] BPW op.cit., p. 474.

[14] Fairplay, January 5th, 1984, p. 25.

[15] Seatrade, April 1982, p. 16.

[16] BPW, op.cit., p. 405.

[17] Ibid., p. 409.

[18] Ibid., p. 407.

[19] Ibid., pp. 405-406.

[20] Seatrade, April 1982, p. 5.

[21] Lloyds Shipping Economist, April 1984, pp. 6-9.

[22] See eg. Damus, S., "Two Part Tariffs and Optimal Taxation: the Case of Railway Rates," American Economic Review, Volume 71, No. 1, March 1981, pp. 65-79, and also Braeutigam, R.R., "Optimal Pricing with Intermodal Competition", American Economic Review, Volume 69, 1979, pp. 38-49.

[23] In the case a bulker carrying containers as deck cargo, the break-even load factors of the latter may be zero.

[24] BPW, op.cit., p. 429.

[25] Fayle, C.E., "A Short History of the World's Shipping," (Allen and Unwin, London 1933), Chapter 9.

[26] See eg. UNCTAD, "Costs and Freight Rates in Liner Trades," TD/4/C.4/128, Geneva 1975.

[27] See eg. Bromwich, M., "The Economics of Capital Budgeting," (Penguin 1976), p. 244.

[28] Seatrade, September 21-27, 1984, p. 9.

[29] BPW, op.cit., p. 358.

[30] Ibid., pp. 356-361.

[31] Ibid., pp. 217 and 360.

[32] Ibid., p. 364.

[33] Ibid., p. 367.

[34] Ibid., p. 475.

[35] Ibid.

[36] Shepherd, W.G. "Competition and Sustainability" contained in "Deregulation: Appraisal Before the Fact", ed. by T.G. Gies and W. Sichel, (University of Michigan Press 1982), pp. 13-34.

[37] BPW of cit., state eg. "This Chapter has undoubtedly raised more questions than it has answered" and "...we cannot pretend to understand completely why intertemporal relationships seem to be vulnerable to unsustainability," p. 443.

[38] Ibid., pp. 208-217.

[39] See eg. Davies, J.E. and Moussa, H., "Natural Monopoly and the Invisible Hand (manuscript) and Brock, W. and Schienkman, J., "Free Entry and the Sustainability of Natural Monopoly: Bertrand, Revisited by Cournot," in"Breaking Up Bell: Essays in Industrial Organisation and Regulation," ed. D.S. Evans, (North Holland, 1983).

[40] See eg. Davies, J.E., "Pricing in the Liner Shipping Industry: A Survey of Conceptual Models," Canadian Transport Commission, Ottawa/Hull 1984, pp. 55-59.

[41] BPW op.cit. p. 291.

Chapter 5

Impediments to Contestability in Liner Markets

5.1 Introduction

It has been emphasised repeatedly to date that the Canadian liner trades appear to be highly contestable: fact and reason point to no other conclusion. It has also been suggested that this finding is likely to be true generally on intra OECD country trades. However, while contestability may be the rule at this point in time there is no presupposition that it will of necessity endure over time. It is quite possible to envision circumstances which could arise that would jeopardise contestability and the favourable welfare consequences that it generates; indeed such circumstances are already commonly present in trades subject to cargo preference legislation. The purpose of this chapter will consequently be to outline the principal potential restraints on contestability which could arise in liner markets. Taxonomically, such restraints may be either intrinsically economic or else they may arise from government policy measures. Both types will subsequently be analysed.

5.2 Economic Constraints on Contestability

As noted in Chapters 2 and 3, in order for a market to be described as contestable three principal conditions must be satisfied; entrant and incumbent must be symmetrically placed, sunk costs must be absent and the price sustainability condition must be met. If any one of these conditions is violated the market will deviate from the contestable condition and economic performance will consequently suffer. In general, it is possible to isolate a variety of circumstances intrinsic to the liner business which could result in departures from these required conditions of contestability, those of potentially greatest significance relating to terminal facilities, contractual practices,goodwill, depressed trading conditions, the institution of conferences and multimodal service developments.

5.2 (i) Terminal Facilities

Circumstances surrounding the use of wharf facilities could create an impediment to contestability for two reasons. Firstly, if the facilities themselves are owned by a certain shipping line, or group of lines, it may be possible for them to deny access to other users and if so the symmetrical treatment of entrant and incumbent would be violated. Secondly, in the provision of shore based facilities sunk costs are very significant. A wharf once built has no alternative uses and neither can it be transferred to different markets.

With respect to the first issue, it has been the practice in some O.E.C.D. countries for lines to own or to arrange with port authorities long term leases for their wharf facilities. Now in the break bulk era wharf side equipment was minimal and therefore any costs associated with its underutilisation were unimportant. Consequently it was relatively inexpensive for the lines owning or leasing the wharf facilities to deny access to entrants, a practice that was not uncommon in Australian trades.[1] With the coming of containerisation, however, the cost of shore based equipment increased drastically,reaching in some trades 50% of total shipping costs [2], resulting in individual lines forming consortia to collectively lease or share terminal facilities. This simultaneously meant that the cost of underutilisation of equipment consequential on denying access to independents became prohibitively expensive. Thus it has been argued that high capital requirements on shore have paradoxically reduced barriers to entry and ensured a more symmetrical treatment of entrant and incumbent than previously ruled.[3]

In the specific context of Canadian trades, if the above described conduct resulted from an agreement between existing lines it would not be legal as any agreement by conference lines to limit the use of port facilities by an independent would, under Section 6 of the Shipping Conferences Exemption Act, 1979, render them subject to the provisions of the Combines Act.

Terminal facilities are not just expensive but, as noted above,the costs of supplying them are sunk, creating thereby an exit barrier. This, however, is a problem only if lines have permanent or exclusive access to them. As E. Bailey notes, such facilities will not be a source of monopoly power if their costs are borne by the government or municipality or if it is mandated that they are shared in a non-discriminatory way by users.[4]

In the case of Canada, ports are normally owned by the federal government or else by a local port corporation that reports to the federal Minister of Transport. In either case, terminals are usually leased to corporations or consortia, which may include shipping lines, which manage their use subject to various operating by-laws that in effect serve to protect universal access to a public facility.[5] Under present practice, then, with non-discriminatory access available to all users, the sunk costs of port facilities do not constitute an impediment to contestability.[6]

5.2 (ii) Contractual Practices

The price sustainability condition for contestability demands that incumbents change their prices more slowly than consumers can respond to them or else that entrants can negotiate pricing contracts with customers: either way the actual entrant will be ensured of a positive profit opportunity if the original prices of the incumbent exceeded unit costs. It was noted in Chapter 3 that explicit or implicit contractual agreements on prices are part of normal commercial practice in liner shipping and serve, at the time they are negotiated, to facilitate entry. However, over the life of the contract the business it ties up will be shielded completely from any further ingress by potential entrants thus creating "...a new and more formidable entry barrier."[7]

Contracts, then, are a double edged sword; the possibility of their negotiation facilitates entry while their conclusion prevents it. Similarly the longer their stipulated period the more enticing is their prospect to entrants but the more prolonged the barrier consequential on their execution.[8] Efficient performance clearly demands a balancing of these two forces.

The socially optimum length of a service contract must be a function of the ease of entry and exit. In an industry where sunk costs are high and therefore where entry and exit are difficult it is only reasonable that the entrant be compensated for his risk through an appropriately long contract: indeed without such a reward it is unlikely that entry would be judged worthwhile. In an industry such as liner shipping where sunk costs are very low the risks of entry are commensurately small,the duration of the positive profit opportunity afforded by a contract need be but correspondingly short. Given the informal nature of most of the agreements negotiated between entrant and shipper this currently is indeed the case since unilateral termination carries no legal penalty. Explicit, legally binding contractual arrangements are clearly different though in a buyer's market such as contemporary liner shipping one would expect these also to be typically short. But irrespective of current practice this clearly has important policy implications and hence will be readdressed in the following chapter.

As a final word on contracts, it should be noted that the traditional loyalty contracts often imposed by conferences are materially different to the explicit time/volume contracts described above. In particular with appropriate notice the former can be legally terminated at any point in time, with the penalty to shippers being not a potential breach of contract suit but the cost associated with possibly losing a rebate or being charged the non-contract rate if the penalities are enforced. As such they are more in the nature of the informal or implicit time/volume agreements with the exception that the costs of any violation of the latter are borne by the line, losing its business. Loyalty contracts have, of course, long been assumed to be an entry barrier and if so would constitute a direct constraint on contestability. Their use, however, has been declining rapidly of late primarily due to the growth of non-conference shipping [9] and their practical consequence, when employed, appears to be minimal is evidenced by the rates of new entry experienced in Canadian trades as described in Table 3.1.

5.2 (iii) Goodwill

A cost which may be irrecoverable on exit is that associated with the nurturing of goodwill. Customer loyalty, business connections and cargo soliciting networks by their very nature cannot be transplated on withdrawal. These facets of the business, moreover, seem to have assumed an increasing importance of late along with the tendency of shippers to become increasingly 'service conscious'.[10] Under some conditions, however, the loss of goodwill may not be inescapable. If, for example, the entire exiting firm were to be sold off or taken over by a new interest wishing to enter the trade,the cost of goodwill may be recovered on exit. Similarly if the departing carrier had made extensive use of NVOCs, freight forwarders or other specialist cargo soliciting agencies, the lost cost of goodwill may be rather small if present at all. Thus as to the general exit inhibiting significance of goodwill it is difficult to make any firm a priori assessment; it likely depends on the specific circumstances of the carrier concerned.

5.2 (iv) Depressed Trading Conditions

The ability to move vessels from trade to trade and the existence of a well developed market for second hand tonnage are two of the principal conditions promoting ease of exit in the liner industry. The exit facilitating character of both conditions, however, is a prior function of the size and type of tonnage in place in relation to the needs of other routes. As noted previously, the standardisation of equipment, since containerisation means that vessels are normally technically capable of serving anywhere so therefore the key determinant of easy exit will be the state of demand on trades elsewhere. The general demand for capacity, then, will determine both the opportunities for redeploying tonnage and the buoyancy of the second hand market.

Under normal trading circumstances it is reasonable to expect that declines and expansions of particular trades will occur simultaneously. Thus,in the case of Canadian trades, the period 1977-1979,which was arguably more depressed than normal, nevertheless witnessed increases in the volume of cargo shipped on some 37 routes and decreases on 41 routes.[11] And there is no reason to doubt that the growth dynamics of trades globally would be materially different. Under such a pattern of growth and decline, opportunities for both redeploying and selling tonnage would likely be available, being fuelled by the needs of those trades experiencing growth. But under a global recession,when all or most trades are simultaneously in decline, possibilities for vessel redeployment would be slim and likewise the second hand market would be generally depressed. The traditional alternatives of laying up or scraping are likewise unsatisfactory given the increasing sophistication and cost of modern equipment. Consequently exit would be very difficult in a general depression and markets would be correspondingly removed from their normally contestable condition.

Although in a general depression, then, markets would not normally be conducive to new entry competition [12], this does not of course imply that conditions would be ripe for the exercise of monopoly power since competition between incumbents for the limited market would become correspondingly pronounced. Thus the state of the market in itself is not a determinant of the degree of competition, its simply determines whether the principal source of competition is to be found in new entry or in struggles between incumbents.

5.2 (v) Conferences as a Restraint on Contestability

It is a popular perception that conference cartels serve to protect the inefficient firm, to keep it solvent when under normal commercial criteria of performance it should be forced to retire.[13] The logic of this argument arises from the juxtaposition of an assumed ability of the cartel to fix prices and the political imperative of accommodating the rate of return needs of the entire membership. Thus, whereas under competition the weaker bretheren would be forced to the wall, the need for consensus required by cooperation demands prices sufficient to ensure their continuity, something which the more efficient members for their part should heartily support, given that such prices will reward them with returns well above normal.

In addition to the entry conditions needed to invest the group with price fixing ability, the above practice will, in itself, constitute an impediment to contestability through interfering with the requirement of frictionless exit. Empirically, however, this argument has been shown to be without substance for, as revealed in Tables 3.1 and 3.3, the rate of exit from conferences has not only matched but in total exceeded that in the non-conference sector. With respect to the entry assumptions required for price fixing ability, namely the presence of high entry barriers, the rate of entry actually observed, as summarised in the data presented in Chapter 3, suggest the opposite. Thus empirically the traditional entry barriers of capital requirements, economies of scale, predatory pricing and loyalty contracts which theorists have reasoned insulate conferences from competitive forces [14] and which, if present, would simultaneously violate the frictionless entry requirement for contestability, seem to have minimal importance. On logical grounds too it has been demonstrated that the assumed entry barriers enjoyed by conferences are likely of generally negligible consequence.[15]

In sum, then, the presence of conference cartels in liner trades appears not materially to influence the contestability of the market, affecting in itself neither the a priori conditions nor the observable market manifestations their fulfilment implies.

5.2 (vi) Multimodal Service Developments

It has been suggested that the development of multimodal services may be accomplished through the vertical integration of firms traditionally engaging in separate transport modes, the result possibly being the creation of a few enormous multimodal carriers, each offering global door to door services.[16] If this is the future and a handful of multimodal companies come to dominate the transport industry,the consequence may be a lack of competition, inflated prices and a quashing of potential competition.[17]

Whether integration and concentration of this sort is a necessary impediment to contestability depends, however, on whether the acquired modes in isolation or the group in totality have characteristics in conflict with the a priori conditions of contestability. Thus if intermodal services demanded an input of rail transportation - where sunk costs may be high - their provision would clearly involve a departure from the degree of contestability experienced on port to port services. However, intermodal services combining trucking or air transport with ocean carriage are unlikely to detract significantly from contestability as, like in shipping, sunk costs are relatively unimportant in these modes.[18] And even in the case of rail, sunk costs may not of necessity create monopoly power for in virtually all countries this mode is either owned or regulated by national governments which presumably could ensure equal access to their services by all firms.

Moreover, it is not clear that as a general principle vertical integration involving a company operating in a contestable market moving into one which is less than contestable, or vice versa, will of necessity bring about an increase in market power in the downstream market.[19] In the express case of multimodalism, Gratwick and Kirby for example have argued that:

> "Monopoly of a single element in a given intermodal package is also unlikely to have any harmful effect on the customer. While this situation may be perceived to exist for a port or a rail route, it has to be remembered that the field of competition between intermodal services is not confined to a single route or even to a single country. Alternatives will always exist, and the term monopoly in the context can be quietly dropped.[20]

It should also be noted that the direct, cause and effect association of multimodal services with merger, concentration, and corporate gigantism is but an hypothesis and arguably a tenuous one. The provision of multimodal services does not of necessity demand the prior ownership of the constituent modes and indeed they can be supplied by firms owning nothing and utilising just an office and a telephone. In many ways the offering of multimodal services is an exercise in brokerage and they can be put together through the appropriate purchase of space on the requisite modes, much in the manner of the holiday package put together by a travel agent.[21] In this way, then, services can be tailored to the needs of individual customers and commensurate with demand,the number of product offerings is potentially much greater under a multimodal than under a port to port regime. Consequently the small, assetless, specialist broker with its inherent flexibility may be much more efficient in putting together multimodal service packages than larger organisations whose primary concern is the operation of vessels or railways.[22] It is thus possible, then, that the development of multimodal services will serve to enhance rather than jeoparidse contestability.

5.3 Political Impediments to Contestability

In addition to the above described economic constraints to contestability it is possible to isolate a variety of politically induced impediments which potentially are of much greater consequence. In particular the use by states of subsidies, nationally specific obligations, national lines and cargo reservation to promote or regulate liner shipping may both be a source of differential treatment between lines and may directly interfere with entry and exit and therefore violate the conditions required for contestability. The use of such measures is very widespread, as demonstrated in Table 5.1, but their consequence, it will be shown, is a function not so much of their general incidence but of the manner in which they are implemented and the degree to which they are prosecuted.

5.3 (i) Subsidies

Subsidies are employed by the governments of most maritime countries to stimulate the development of their national fleets in pursuit of a variety of public policy objectives.[23] Irrespective of their particular form shipping subsidies are intrinsically discriminatory in that they are extended only to vessels registered under the national flag. Consequently they potentially imply differential treatment of lines of different nationalities and thus may violate the requirement of contestability that entrant and incumbent are symmetrically placed.

In a global context, the significance of such a violation is not, however, likely to be great as all the principal maritime nations extend some

Table 5.1

The Extent of Maritime Promotion Policies in the World's Major Shipping Nations[1]

Country	Subsidies[2]		Fiscal[3]	Cargo[4]	State
	Construction	Operating	Preferences	Preference	Fleet
Algeria				x	x
Argentina	x	x	x	x	x
Australia			x		x
Belgium	x		x		
Brazil			x	x	x
Canada	x				
Chile			x	x	x
Columbia			x	x	
Denmark	x		x		
Ecuador				x	
Egypt			x	x	x
Finland	x		x		
France	x			x	
W. Germany	x		x		
Ghana				x	x
Greece	x		x		
India	x			x	x
Indonesia			x	x	x
Ireland	x		x		x
Israel			x	x	x
Italy	x		x		x
Japan	x		x		
Korea	x	x	x	x	
Malaysia			x	x	x
Mexico		x	x	x	
Morocco			x	x	x
Netherlands	x		x		
Nigeria			x	x	

Table 5.1 (cont'd)

Country	Subsidies[2]		Fiscal[3]	Cargo[4]	State
	Construction	Operating	Preferences	Preference	Fleet
Norway	x		x		
Pakistan	x			x	x
Peru	x		x	x	x
Phillipines	x		x	x	x
Portugal	x				
South Africa	x				
Spain	x	x	x	x	x
Sweden	x		x		
Switzerland	x				
Taiwan	x			x	x
Thailand				x	x
Turkey	x				
U.K.	x		x		
U.S.A.	x	x	x	x	
Uruguay			x	x	x
Venezuela				x	x

Notes: [1] Excludes flags of convenience countries

[2] Only subsidies given to private companies are included

[3] Includes loan financing assistance

[4] Excludes cabotage restrictions

Source: "Maritime Subsidies," U.S. Department of Transportation, Maritime Administration, February 1983.

form of actual or implicit subsidy to their shipping and hence in large they offset each other and therefore leave all players similarly positioned.[24] Indeed, the acknowledged purpose of some overt subsidisation, such as that extended by the USA, is not so much to assist national flag shipping for the sake of it but to allow it to compete on symmetrical terms with foreign competitors which may be enjoying lower labour costs and the perks associated with flags of convenience registry.[25] More generally, given that, for reasons of the national interest, many or most states wish to have a nationally registered merchant fleet, and given the existence of flags of convenience and other low labour cost countries, the maintenace of competitive national fleets, for the OECD countries at least, implies subsidisation simply to neutralise the benefits of registry in the former. As the O.E.C.D. puts it,

> "Subsidies and fiscal benefits are granted to balance certain real or assumed cost disadvantages and thereby improve the competitiveness of a national fleet in order to achieve a balance of equality of chances with other nations' fleets."[26]

Given this institutional setting, then, the practice of subsidisation has the intent and arguably the consequence of maintaining between different flag lines equal opportunities to compete - something necessary for contestability - through offsetting what may be described as market distortions elsewhere.[27]

Although the political environment of the international liner shipping industry is such that subsidies per se are unlikely to constitute a significant source of differential treatment between different flag lines, it is nevertheless possible that they may create conditions for the differential treatment of carriers flying the same flag. In particular, it is sometimes the practice for subsidies to be extended not to all nationally registered shipping companies but simply to those which meet certain specified conditions. Thus in the case of the U.S.A., which in absolute terms is the world's largest subsidiser of ocean shipping [28], the operating subsidy provided by the amended 1936 Merchant Shipping Act can be extended only if the firm serves on certain specified routes and refrains from owning, chartering or operating foreign flag vessels, while eligibility for the construction subsidy requires that the vessels be built in U.S. yards and match the requirements of U.S. foreign commerce and be suitable for military purposes in time of war or national emergency.[29] Consequently the form of some governmental subsidy measures may result in differential treatment of lines registered under the national flag: indeed the operations of many U.S. container companies have been such as to render them ineligible for subsidy under the Merchant Marine Act.[30]

In like manner, it is possible that subsidisation through the extension of fiscal incentives may potentially descriminate between different lines flying the same flag. In particular, under some regimes of fiscal assistance, investment or depreciation allowances are extended which can be used to write off wholly or in part tax liability on profits or else to defer it to the future where its discounted present value is reduced.[31] Such measures, of course, can be utilised only by companies already in existence and earning positive profits on which taxes would otherwise be due. A newly created company, however, having no prior accumulation of profit would not be able to utilise such allowances. Consequently the post tax profitability of any investment in shipping is likely to be higher for established than for new companies, or, expressed alternatively, a lower rate of return would be needed to make an investment acceptable for existing companies than for newly created entrants. Consequently some forms of fiscal assistance may discriminate against the newly created company, creating thereby a barrier to entry and a consequential violation of the contestability conditions.[32]

In addition to its discriminatory application or consequence, subsidisation may also constitute a restraint on contestability by impeding ease of exit. The degree of such constraint, however, depends on the type of subsidy involved. In the case of construction subsidies, it is the shipbuilder who is normally the principal and targeted beneficiary [33] and since the implicit subsidisation of shipping through the explicit subsidisation of shipyards benefits equally all shipowners, it does not in itself distort commercial relations between firms. Construction subsidies may, of course, depress the prices of second hand tonnage which may, in turn, possibly increase the costs of exit effected through the sale of equipment. But as new prices are similarly depressed it is more likely that subsidisation will have no significant effect on price differentials between new and second hand equipment and therefore will not materially add to the risks of entry or exit.

Perhaps the potentially greatest threat posed by construction subsidies lies in the oversupply and excess capacity it may stimulate as this, once in place, may constitute an intrinsic obstacle to entry or else may be used by incumbents as a weapon to deter entry.[34]

With respect to fiscal incentives, these, as noted previously, may have the effect of reducing the post tax rate of return required to make any investment in shipping acceptable and therefore may arguably impede exit by allowing recipient firms to remain solvent longer and at lower prices than would be the case under a singularly unsubsidised regime. However, given the commonality of the practice under OECD flags and the option of convenience registries, shipping companies generally will be similarly placed and therefore fiscal incentives in themselves are unlikely to cause commercially viable rates of return to vary significantly between different flag lines.

Of the various types of subsidies that governments have extended to their shipping, direct operating subsidies undoubtedly pose the greatest threat to contestability. With both construction subsidies and fiscal incentives the institutional environment of the industry, as noted above, is such that different flag carriers will nevertheless be similarly placed and the maximum assistance that is technically available is limited by the nature of the subsidy. Thus zero taxes on profits or the complete purchase of a vessel (which never happens) is the upper limit possible under fiscal incentives or construction subsidies respectively and even this in itself does not guarantee corporate survival. In contrast, a continuing commitment to the subsidisation of operating costs, making good from the public treasury any losses incurred, renders the recipient immune to the consequences of normal commercial competition and does guarantee survival. Consequently operating subsidies directly violate both the ease of exit and symmetrical treatment requirements of contestability and at the same time allow the indefinite maintenance of inefficiency - a result specific to the type of subsidy.[35]

The above picture of the adverse consequences of direct operating subsidies was sketched on the basis of assuming the government extending them does so continuously, with no bottom line. If the extent of subsidy is limited then the conclusions will be different in degree though not necessarily in kind. In the case of the U.S.A., for example, the operating subsidy available under the amended 1936 Merchant Marine Act is a "differential subsidy", designed to bridge the gap between American and foreign operating costs.[36] Consequently while this may allow some margin for inefficiency it clearly does not guarantee survival in a competitive market because there is a specified upper limit to its magnitude.

As for its actual impact in shipping markets, the limited extent of operating subsidies renders it relatively insignificant in the competition between the lines of OECD maritime nations though it is, of course, a much more significant problem in the case of Soviet shipping.[37]

5.3 (ii) National Fleets

The consequences of the existence of national fleets or state backed lines are similar in nature to those of direct operating subsidies. Firstly, in their presence firms will not be competing on symmetrical terms since the viability of state backed lines is not conditional upon commercial success. The very existence of a state fleet testifies to a prior conclusion of the inability of the market sector to spontaneously generate the kind of merchant marine judged appropriate for the objectives of the 'national interest'. And what market forces cannot provide market forces will not be allowed to take away. Consequently like open ended operating subsidies, the presence of national lines results in an asymmetric competition between the public and private carrier and a simultaneous violation of the frictionless exit requirement of contestability.

As for the overall consequence of the spread of state backed shipping, especially Soviet shipping, it has been widely regarded as one of the principal threats to the free market shipping of the OECD countries, though at present the threat appears more latent than actual.[38] Moreover, it should also be noted that several OECD countries have enacted legislation enabling them to retaliate or otherwise neutralise unfair competition from state backed lines [39] so its is possible than any future actual problems may be countered. Nevertheless the overall proliferation of state backed shipping must be regarded as a major potential impediment to the contestability of liner markets and to commercially orientated shipping in general.

5.3 (iii) Regulations and Conditions of Service

As noted above, one reason why subsidies may constitute a potential impediment to contestability is the differential treatment of lines they may give rise to. Similarly, differential treatment may also be present if various regulations, conditions or obligations are imposed upon specific lines rather than falling generally upon all. Particularly important in this respect are any stipulations that vessels can only employ crew that are nationals of its country of registry because wage costs are the only element in operating costs that vary significantly internationally.[40] Consequently lines which register their vessels in the high labour cost OECD countries that have such manning regulations, namely the U.S.A., Portugal, Turkey and Italy [41] should, other things being equal, be positioned differentially and adversely in relation, say, to the low labour cost countries of the third world. Indeed, it is differences in labour costs that are likely the proximate cause of the recent relative decline of the fleets of the traditional maritime countries.[42] To a certain extent, however, the shipowner in the

OECD countries can offset his labour cost disadvantage by either flagging out or else by investing in labour saving technology.[43] Consequently at the present time the OECD shipowner generally has sufficient flexibility in his business operations to allow him to compete on similar terms with commercial competitors based internationally. However, should flags of convenience be phased out as many developing countries, UNCTAD and the International Transport Workers' Federation evidently desire, the options of the OECD shipowner will become much more limited and one can hypothesise that in the absence of increased subsidisation a migration of all but the most technically sophisticated tonnage to the developing countries flags would likely ensue.

5.3 (iv) Cargo Reservation

Of all the various means by which governments intervene in liner markets, cargo reservation is the most disruptive to commercial competition and consequently poses the greatest threat to the contestability of liner markets. Essentially cargo reservation involves a country reserving a certain portion of its trade, often 50%, for its own vessels, a practice traditionally implemented on a unilateral or bilateral basis, though with the implementation of the UNCTAD Code multilateral cargo reservation predicated upon the 40/40/20 formula is likely to become the rule. This administration of cargo movement inevitably involves the disruption of traditional patterns of seaborne commerce, as government decree replaces shippers' choice in the selection of vessels. In consequence the volume of cargo available for private competition will be reduced in proportion to that reserved for the national fleet of the enforcing country, the limiting case being a 50/50 bilateral division of the trade which would eliminate all non-national commercial competition.

In the limiting case, cargo reservation will result in the creation of a legal monopoly that will insulate completely the incumbent national flag lines from market forces. Contestability consequently becomes an irrelevant consideration. The basic effect of the official exclusion of natural competitors will be not just the creation of conditions favourable for propagating the abuse of monopoly power and the imposition of inflated freight rates [44] but also the encouragement of inefficiency both through the initial chanelling of business to carriers which may be adjudged, by virtue of their dependency on such aid, to offer services that are either more expensive or less adequate than their competitors and through the subsequent exclusion of competitive discipline.

The above described monopoly propelled inefficiencies, while no doubt potentially significant, nevertheless are of limited consequence in the sense that they are restricted to the confines of particular trades. Of more global import may be the constraint on contestability posed by the effect of cargo reservation in artificially segmenting liner markets and undermining the flexibility of the industry.[45] In Chapter 3 it was noted that one of the principal reasons behind the high degree of contestability witnessed in Canadian trades was the ability of vessels to be moved from trade to trade and the consequences this has on the size of the pool of potential competitors from which any trade can draw. Cargo reservation, however, once institutionalised prevents such movement and flexibility and therefore may have wider and more generally deleterious effects on contestability than those immediately observed in the trades where it is practised.

5.4 Conclusions

This chapter has endeavoured to show that it is possible to isolate a variety of potential impediments to the contestability of liner markets issuing from both economic and political sources. The economic constraints identified generally appear of minimal consequence now and are unlikely in themselves to constitute a significant potential threat in the foreseeable future. In contrast, the restraints on contestability arising from government policy are of much more concern. Admittedly given the nature of the political and economic environment within which the liner industry operates, many national policy measures are evidently self cancelling, and therefore at the moment are not major obstacles to commercial competition and contestability. However, other measures, especially direct operating subsidies, national fleets and cargo reservation constitute a major threat to the continuation of a commercial shipping regime and, of course, to contestability which is relevant only under such a regime. At the moment, however, these practices appear not seriously to have undermined the market environment of intra OECD trades but they could easily do so in the absence of an appropriate, countervailing policy safety net. It will be the task of the following chapter to outline the kinds of options which must be considered if a contestable, market environment is to be maintained in such trades.

Notes and References

[1] Zerby, J.A., "Competition in Cargo Handling: Some Comments," *Maritime Policy and Management*, Volume 9, No. 4.

[2] Conlon, R.M. and Zerby, J.A., "*Public Policy in the Liner Shipping Industry*," Centre for Applied Economic Research, Paper No. 20, University of New South Wales, December 1983, p. 11.

[3] Ibid.

[4] Bailey, E.E., "Contestability and the Design of Regulatory and Antitrust Policy," *American Economic Review*, Pap. and Proc., Volume 71, No. 2, May 1982.

[5] As an example the port of Halifax leases terminal facilities to two groups, Haltern Ltd. and Ceres Corp. which manage their use. These corporations cannot deny access to any firm and under exceptional circumstances the landlord - the port authority - can even reassume full control.

[6] It should be noted that some wharf-side equipment, in particular forklifts and toplifters, is commonly owned by shipping lines, though both types of capital are transferable and salable and hence do not constitute a sunk cost.

[7] Baumol, W.J. Panzar, J.C. and Willig, R.D., "*Contestable Markets and the Theory of Industry Structure*," (Harcourt Brace Jovanovich, New York 1982) p. 291.

[8] As a case in point, in the late 1970's the ABC Line tried to break into the Europe/New Zealand trade by securing a 15 year contract with a large shipper, Waitaki N.Z. Refrigerating Ltd. Both ABC and Waitaki were enthusiastic about this but the other shipping lines less so. A court case resulted out of the situation as Waitaki had broken a contract with the New Zealand Meat Producers Board. Eventually the High Court of New Zealand ruled that Waitaki's proposed contract with ABC was illegal given the former's prior contractual obligations.

[9] Cotton, A.R., "Conference-Shipper Loyality Contracts: Time for a Rethink?", *Maritime Policy and Management*, Volume 11, No. 2, 1984, esp. pp. 80-82.

[10] Pearson, R., "*Containerline Performance and Service Quality*," Marine Transport Centre, Liverpool, 1980, p. 1; and also Brooks, M., "An Alternative Theoretical Approach to the Evaluation of Liner Shipping," *Maritime Policy and Management*, Volume 11, No. 1, 1984.

[11] Figures from the data base of the Water Transport Committee of the C.T.C.

[12] It should be noted that a general depression does not necessarily imply the complete cessation of new entry competition since the depressed second hand market may provide opportunities for new firms to acquire tonnage very cheaply.

[13] See eg. Deakin, B.M., "Shipping Conferences - Some Economic Aspects of International Regulation," Maritime Studies and Management, Volume 2, 1974, p. 17.

[14] Davies, J.E., "Pricing in the Liner Shipping Industry: A Survey of Conceptual Models," Canadian Transport Commission, Ottawa/Hull, 1984, Chapter 3.

[15] Ibid., Chapter 4.

[16] Dempsey, P.S., "Transport Deregulation - On a Collision Course," Transport Law Journal, Volume 13, 1984, pp. 383-5.

[17] Ibid.

[18] See eg. Bailey, E.E. and Panzar, J.C., "The Contestability of Airline Markets during the Transition to Deregulation," Law and Contemporary Problems, Volume 44, Winter 1981 and Gaskins and Voytko, J.M., "Managing the Transition to Deregulation," Law and Contemporary Problems, Volume 44, Winter 1981.

[19] See. Tye, W.B., "Some Subtle Pricing Issues in Railroad Regulation: Comment," and Baumol, W.J., "Some Subtle Issues in Railroad Regulation: Reply," International Journal of Transport Economics, Volume 11, August-December 1984.

[20] Gratwick, J. and Kirby, M., "Multimodal Ownership and Intermodality," contained in Proceedings of the 19th Annual Meeting of the Canadian Transport Research Forum, Jasper,Alberta, May 1984.

[21] See "Multimodal Companies: What are the Possibilities," Container News, June 1984.

[22] I am endebted to John Gratwick for impressing these points upon me.

[23] For a listing of these objectives, see Sturmey, S.G., "A Consideration of the Ends and Means of National Shipping Policies," (Bergen: Institute for Shipping Research, 1965).

[24] Bohme, H., "Restraints on Competition in World Shipping," Thames Essay, No. 15, (Trade Policy Research Centre, London 1978), p. 26.

[25] Jantscher, G.R., "Bread Upon the Waters: Federal Aids to the Maritime Industries," (Brookings, Washington, D.C., 1975) Chapters 3,4.

[26] "Maritime Transport 1983," OECD, Paris, 1984, p. 94.

[27] Bohme, op.cit., pp. 35-37.

[28] See "The Maritime Aids of the Six Major Maritime Nations," U.S. Department of Commerce, Washington, D.C., September 1977 and American Shipper, January 1978, p. 14.

[29] Jantscher, op.cit.

[30] Ibid., p. 72.

[31] See Gardner, B.M. and Richardson, P.W., "The Fiscal Treatment of Shipping," Journal of Industrial Economics, Volume 22 (1973).

[32] Marlow, P. and Gardner, B.M., "The Fiscal Treatment of Shipping: Some International Comparisons," UWIST, Department of Maritime Studies, August 1978, p. 77.

[33] O.E.C.D., op.cit, p. 94.

[34] Hilke, J.C., "Excess Capacity and Entry: Some Empirical Evidence," Journal of Industrial Economics, Volume 33, December 1984.

[35] "The Development of Merchant Marines in Commonwealth Developing Countries," Commonwealth Secretariat, London 1977, p. 85.

[36] Jantscher, op.cit.

[37] See eg. "Soviet Shipping - A Seatrade Study," Seatrade, February 1976 and "Russian Roulette," the Shipbroker, April 1981.

[38] O.E.C.D., op.cit., pp. 88-9.

[39] Countries possessing such legislation include W. Germany, France, Italy, Sweden, Norway, Denmark, Finland, Spain, U.K., Netherlands, Japan and Australia. For a commentary on the provisions and rationale of the U.K. and U.S.A. legislation see respectively, Cadwallader, F.J.J., "Flag Discrimination or Something More," Current Legal Problems, Volume 29, 1976; and Ellsworth, R.A., Schmitt, A.L. and Zerby, J.A., "Regulating the Rate Practices of State Controlled Shipping Companies: the Development and Implementation of the Ocean Shipping Act of 1978," Journal of Maritime Law and Commerce, Volume 12, No. 4, 1981.

[40] See UNCTAD, "Merchant Fleet Development," TD/222 Manila 1979, p. 21.

[41] O.E.C.D., op.cit., p. 69.

[42] See "Crew Costs and their Impact on Employment," WP/20/84/16, Canadian Transport Commission, May 1984.

[43] Ibid.

[44] Lawrence, S.A., "U.S. Merchant Shipping Policies and Politics," (Brookings, Washington, D.C., 1966), p.50.

[45] Horn, J., "Nationalism v. Internationalism in Shipping," Journal of Transport Economics and Policy, September 1969, pp. 245-250.

Chapter 6

Promoting Contestability in Liner Markets

6.1. Introduction

The rationale of promoting contestability in liner or any other markets flows from the favourable welfare consequences its presence implies. Contestability is a generalisation of perfect competition and its presence, as with the latter, secures an optimal allocation of resources and therefore maximises consumer welfare. Like perfect competition, perfect contestability is an ideal and therefore probably impossible of attainment in practice. The best that market forces can reasonably be expected to do, either spontaneously or assisted by appropriate policy, is to tend towards the condition rather than to reach it.

It has been suggested, however, that unlike perfect competition, where slight departures from its structural requirements imply only slight departures from its welfare consequences, the welfare effects of departures from perfect contestability are discontinuous so that minor deviations from the a priori conditions may generate very major reductions in economic welfare.[1] Other studies, however, have shown that this is not likely to be the case and that the welfare implications of contestability analysis are in fact continuous, with economic welfare continuously improving as the condition is approached.[2] The performance of markets approaching perfect contestability will consequently be very efficient and there would appear to be no case for government regulation or involvement in the industry. In the words of Baumol et al,

> "...we have concluded that if an industry is structurally contestable and is behaving accordingly, and, if, in addition, it has sustainable configurations available to it, and if none of these involve any significant welfare problems, then that industry is best left to its own devices with no government interference, even if it is composed of a very small number of firms." (emphasis original). [3]

There is however, a very significant caveat in the above statement relating to "sustainable configurations." As noted in Chapter 4, unsustainability of the intertemporal variety is perceived by Baumol et al to be the rule rather than the exception and its presence may imply government intervention, if economic welfare is to be maximised, even if the market is otherwise perfectly contestable.[4] Consequently appropriate public policy may need to target on much more than simply an evaluation of the extent of contestability and in this respect Baumol et al identify no less than seven tasks that have to be performed if industrial policy is to be appropriately structured. In summary these seven tasks include:

1. Determination of the cost-minimizing industry structure for the industry being examined. Here one should identify which, if any, of the industry's products can be produced most inexpensively by a monopoly, and which are "naturally competitive."

2. Determination of the degree of contestability of the market, and of the proximity of the behavior of the industry to that which would be expected under perfect contestability.

3. Determination of obstacles to contestability and evaluation of the difficulty of their reduction or elimination. If the market is not reasonably contestable it becomes important to determine whether measures to increase contestability are a practical option, and for

this purpose it is necessary to identify those obstacles and the degree to which they can be affected by public policy.

4. Determination of whether or not sustainable configurations for the industry exist.
5. Qualitative and quantitative description of sustainable configurations.
6. Identification of any substantial welfare problems, such as externalities or second-best difficulties, associated with the sustainable configurations.
7. Description of any institutional inhibitions to the adoption of efficient intertemporal price patterns.[5]

It thus appears that far from rendering the normative appraisal of real world market performance more precise and less invitive of subjective assessment than the old workable competition,it has, in demanding compliance with such an extensive and difficult set of tasks, achieved the opposite. This,however, is a problem only to the extent that the requisite tasks address issues that are directly relevant to the formulation of public policy. Thus if one accedes to the view that unsustainability is a mere curiosum or can argue that if present, the consequences of its cure (in terms of government involvement) are likely worse than its continued existence, then tasks 4-7 can be dispensed with and attention concentrated simply on tasks 1-3. Given the current debate over the relevance of unsustainability analysis - as summarised in Chapter 4 - it is probably reasonable to argue at this time that while it may be prudent not to dismiss it out of hand completely,it would nevertheless be inappropriate systemmatically to structure efforts to shape public policy on the basis of its hypothesised presence.

It is tasks 1-3, then, that are of most direct importance in the formulation of policy options to safeguard the public interest. All these tasks, moreover, are closely interrelated in that the degree of contestability experienced in any market is both an obvious function of the extent of any obstacles to its presence and is also the determinant of the extent to which the actual structure of the market can depart from the cost minimising structure.

Having identified that "contestability" per se is the key issue one may procede by noting that the passive evaluation of its degree is clearly the policy precusor of its active promotion. With respect to the former, the key variables which one must consider will be firstly the degree to which the business and institutional environment of the industry allows the a priori conditions to be realised and secondly,the directly observable, physical characteristics which simultaneously are suggestive of the extent of contestability, in particular profit levels and the experience of entry and exit. This, of course, is precisely the kind of exercise that was previously carried out in Chapter 3.

The promotion of contestability judged appropriate pursuant to its prior assessment can procede along two basic avenues, each implying a qualitatively different degree of government intervention. In the first place, and implying minimal intervention, the business and institutional environment of the market may be moulded so as to allow it more closely to approach what is required for the satisfaction of the a priori conditions. Secondly, one may more directly influence the behaviour and conduct of firms through intervention by way of standard competition policy. Each of these methods will be discussed below.

6.2 Promoting an Environment Facilitating Contestability

Perfect contestability, as emphasised previously, demands that sunk costs be absent, that the price sustainability condition be satisfied and that entrant and incumbent are symmetrically placed. Each of these conditions may be promoted through securing appropriate conditions within the business environment of liner operators. With respect firstly to sunk costs - the determinant of ease of exit - the following options may serve to minimise their potential consequence.

6.2 (i) Maintenance of Equal Access to Port Facilities

As noted in the previous chapter it is port facilities that are likely to constitute the largest element of sunk costs in the liner operators' environment. The solution here is to ensure that port facilities are owned and managed by non-commerical interests (ie. federal or municipal port authorities) in such a way as to ensure that all potential users have equal access to them. In this way the sunk costs will be borne by the port authority and not its users and hence they will not invest the latter with a source of monopoly power. The current practice of lines or consortia leasing wharf facilities from port authorities is fine provided the form of the arrangement is non-discriminatory and that safeguards are included so as to permit the easy transfer or sale of the lease and/or the shared use of the facilities.

6.2 (ii) The Maintenance of Independent Freight Forwarders

It has been previously suggested that a cost which may be irrecoverable on exit is that associated with the development and maintenance of customer goodwill, in particular as it relates to the establishment of local cargo soliciting networks. Now if the latter could be subcontracted to specialist cargo brokers there would be no such loss on exit. Moreover, entry too would be facilitated through the establishment of an obvious and direct channel by which the entrant can negotiate for traffic. The maintenance of a healthy and independent freight forwarding industry may thus contribute to the enhancement of contestability in the liner shipping industry.

6.2 (iii) Improved Standardisation of Facilities and Equipment

The possibility of transfering tonnage from trade to trade is one of the principal reasons why exit is so relatively easy in the liner industry. To enhance further the possibilities of vessel redeployment, improved standardisation of equipment and other service variables should be encouraged. This would serve to minimise any physical barriers there may be to impede such movements.[6]

6.2 (iv) Keeping Liner Trades Open

To facilitate vessel redeployment, to stimulate the second hand market in vessels and equipment and to maximise the pool of potential entrants from which any particular trade can draw, it is imperative that liner trades remain open. Without liner trades in general remaining open no trade in particular could ever be highly contestable. This really means that the extent of cargo reservation in a world context must be minimised. The E.E.C. initiative to disapply the cargo sharing provisions of the Code of Conduct on intra OECD trades must clearly be regarded as an important step in this direction.[7]

6.2 (v) Other Environmental Conditions influencing Sunk Costs, Entry and Exit

Hit and run entry is shown by contestable market theory to be a major force disciplining conference or independent incumbents and its possibility may serve to prevent even short term profiteering. It is the institutions of the industry which, in large measure, are responsible for its presence. The intelligence available through the trade press, Lloyds and other information gathering agencies, the NVOCs,and previously described freight forwarders which are strategically placed to quickly respond to customer needs, all create an environment within which knowledge of opportunities is freely available and quickly disiminated. Like perfect competition, perfect contestability cannot be secured without perfect knowledge - a very underplayed assumption - and the above described conditions serve to create a situation in which the level of market intelligence will be high. On top of this, the charter and second hand markets and the possibility of vessel redeployment, mean that the physical response time of producers to market conditions will be quick. Together, then, the above conditions allow for both the possibility of hit and run entry and for speedy adjustments of supply to demand through less transitory entry and exit and internal adjustment. More generally, the well developed state of market intelligence coupled with speedy physical reaction times should also serve to allay any fears there may be over intermodal service developments: the possibility of cornering the market under such circumstances is likely very remote indeed.

In terms of the public policy implications of the above, it is evident that the maintenance of contestability in liner markets demands a commitment to the maintenance of the market institutions which the industry currently possesses. This, of course, is closely linked to the requirement that liner trades remain open since such institutions evolved in the first place in response to the service requirements of open trades.

6.2 (vi) Environmental Conditions Promoting the Price Sustainability Condition

The price sustainability requirement of contestability demands either slow price responses by incumbents relative to consumers or the possibility that entrants may negotiate service contracts with customers. Of these conditions only the latter lends itself to policy initiatives since it is not feasible to prevent or artificially delay the price responses of existing firms to changing market circumstances. Time and/or volume contracts between shipowners and shippers would appear, then, worthy of encouragement, subject, however, to one important qualification.

The duration of any explicit contractual arrangement, as noted in Chapter 5, should be limited lest the facilitation of contestability it may allow becomes transformed into a substantial obstacle. In this respect as entry and exit appear to be relatively easy and therefore riskless, as shown in Chapter 3, the contract required to reward entrants need be appropriately short.

More specifically, both Tables 3.3 and 3.4 show that entry and exit can occur within the course of a single year, and, assuming that what is desirable ought to be practical, a year may therefore constitute a reasonable initial guide towards framing an appropriate policy towards contractual arrangements. Whether this should constitute a mandatory upper limit, however, is difficult to ascertain in the light of no previous experience. The circumstances surrounding different agreements may vary substantially therefore forcing all into the same mould may be undesirable. But if one accepts the principle that an upper limit to the duration of service contracts is socially desirable then it behoves the policy maker to conduct the investigations necessary to ascertain what is appropriate and acceptable.

6.2 (vii) Promoting the Symmetrical Positioning of Entrant and Incumbent

The symmetrical treatment of entrant and incumbent is a necessary condition of contestability. As discussed in Chapter 5, however, the existence of state backed lines, cargo reservation and subsidisation may serve either to bring about differential operating conditions between different flag lines or between different lines flying the same flag thus potentially violating the condition. The simple solution to this problem would be the elimination of all maritime promotion policies, something clearly impossible and therefore futile to debate. The elimination or avoidance of the more grossly disruptive policies - cargo reservation and state fleets - is, however, a practical proposition on the intra OECD trades, and, as noted previously, the EEC reservation on the UNCTAD Code is an important move in this respect. Similarly legislation such as the USA's Ocean Shipping Act of 1978 which may combat incursions into intra OECD trades by non-member state lines is likewise an important development towards securing a similar positioning of the private and the nationalised carrier.

The elimination of subsidies, however, is not feasible given the policy objective of most OECD countries of having a national flag fleet subject to national regulations and given the simultaneous existence of flags of convenience. The form of subsidy, however, may be a policy variable. In this respect, a general commitment towards an overall level of subsidisation sufficient no more than to offset the cost advantages of non-member registries coupled with an avoidance of the direct operating subsidy may serve to help secure equal opportunities to compete for member lines. On top of this, the form of the subsidies that are extended should also be examined to ensure that their incidence is shared equally by all nationally registered lines. In combination, these measures may help ensure that all OECD lines - whether entrant or incumbent - are able to compete on similar terms.

6.3 Securing Contestability Through Government Intervention

If the nature of a market appears to be singularly at variance with the requirements of contestability and if remedial work aimed at improving its environment appears either impossible to effect or unsuccessful in application then it may be desirable more directly to circumscribe the conduct and performance of the market by way of government intervention. Such intervention can proceed along a variety of different avenues, those traditionally employed being taxation, price controls, moral suasion, public regulation and antitrust policy.[8] The principal conditions seen to warrant such intervention are monopolistic structures, price fixing agreements, price discrimination, exclusive patronage contracts and resale price maintenance.[9] The last aside, all of these conditions are observable in the liner industry and therefore it is no surprise that its rigorous regulation has been advocated in some quarters.[10] However, doubts have been increasingly raised as to whether these conditions of necessity will result in poor market performance and whether remedial intervention will not serve to create new problems of its own rather than materially improving economic welfare.[11]

Baumol et al share these concerns and judge that many of the traditional per se indicators of poor market performance can in fact lead to desirable performance and should even be presumed to do so in the light of their contestability and unsustainability analysis.[12] Consequently it has become increasingly difficult to ascertain structural or behavioural conditions that truly warrant government correction. As a result of these problems, Joskow and Klevorick have advocated a two-part test to evaluate the desirability of regulation:

Step 1: Examine the market's contestability. If it satisfies criteria of contestability, interference with the market mechanism should be ruled out;

Step 2: Even if the contestability criteria are violated, proposals for intervention should be approved only on the basis of an evaluation of costs and benefits.[13]

These steps, it should be noted are not dissimilar in intent to the first three tasks identified by Baumol et al, as discussed above. On the basis of these guides it seems clear that government intervention in the industry would not be appropriate at this point in time given its close satisfaction of the conditions for contestability as discussed in Chapter 3. It has been suggested, however, that although the strategic behaviour of conferences - in particular as it relates to the use of loyalty ties - does not seem a tangible problem now, it has been in the past and consequently may again be in the future:[14] a continued surveillance of their behaviour and of the physical signs that are indicative of the extent of the contestability of their markets, as discussed earlier, would thus be prudent.

6.4 Conclusions

Perfect contestability, like perfect competition, leads to socially optimal economic behaviour, the maximisation of consumers' welfare and an optimal allocation of resources. Its promotion is therefore clearly in the public interest. The necessity of its active promotion by government is a function of the extent to which the industry spontaneously approaches the conditions required for contestability. The assessment of this, in turn, demands a continuing surveillance of the rate and impact of entry and exit, profitability levels, the strategic behaviour of conferences and the environmental conditions which circumscribe the degree to which the a priori conditions of contestability can be realised.

Given the apparent highly contestable state of contemporary Canadian liner shipping, it would seem that the appropriate current objective would be to strive to maintain this condition, in particular by ensuring that the environment of the industry continues to function in such a way that access to port facilities remains open, that an active freight forwarding industry continues to flourish, that the informational services supporting the industry remain highly developed, that contractual practices and conference behaviour in general be continuously monitored, and, above all that trades remain open and that subsidisation serves no more than to maintain equal opportunities to compete. The accomplishment of such tasks is clearly beyond the capabilities of any country acting unilaterally: a cooperative effort is clearly required. Fortunately, however, the institutions by which this may be accomplished, in particular the OECD, are already in place.

Notes and References

[1] Schwartz, M. and Reynolds, R.J., "Contestable Markets: An Uprising in the Theory of Industry Structure: Comment," American Economic Review, Volume 73, June 1983, pp. 488-490.

[2] Baumol, W.J., Panzar, J.C. and Willig, R.D., "Contestable Markets: An Uprising in the Theory of Industry Structure: Reply," American Economic Review, Volume 73, June 1983, pp. 491-496 and Coursey, D, Issac, R.M., Luke, M., and Smith, V.L., "Market Contestability in the Presence of Sunk (Entry) Costs," Rand Journal of Economics, Volume 15, No. 1, 1984.

[3] Baumol, W.J., Panzar, J.C. and Willig, R.D., "Contestable Markets and the Theory of Industry Structure," Harcourt Brace Jovanovich, New York, 1982, p. 466.

[4] See Chapter 2.

[5] Baumol et al, op.cit., p. 467.

[6] Conlon, R.M. and Zerby, J.A., "Public Policy in the Liner Shipping Industry," Centre for Applied Economic Research, University of New South Wales, 1983, pp. 63-4.

[7] For a commentary on the EEC initiative, see Tetley, W., "Liner Conferences in Canada under Canadian Law and the U.N. Code of Conduct for Liner Conferences," Transport Canada, TP3892E, 1982, Chapter 3.

[8] See eg. Scherer, F.M., "Industrial Structure and Economic Performance," Second Edition, Rand McNally, Chicago, Chapters 18-21.

[9] Ibid. Chapters 18-21.

[10] See eg. the U.S. Department of Justice's, "The Regulated Ocean Shipping Industry," Washington D.C., 1977.

[11] Scherer, F.M. op.cit. Chapters 19-21.

[12] Baumol, et al, op.cit., p. 477.

[13] As cited in Baumol et al, op.cit., p. 477.

[14] Conlon and Zerby, op.cit., p. 64.

Chapter 7

The State of Contestability Theory and its Role in the Economic Analysis of Liner Shipping

The broad objectives which the theory of contestable markets aspires to secure - the positive and normative analysis of market structures - is clearly of direct relevance to a wide variety of different interest groups including economists, lawyers, businessmen and policy makers. Many of the ideas which the theory develops, moreover, have been around for some time.[1] Yet despite their obvious importance to the above groups they evoked little response other than customary "further refinement" until Baumol's Presidential Address to the American Economic Association in 1982.[2] Primarily this was because the severe mathematical techniques employed rendered them inaccessible to the non-specialist reader; indeed, even specialists in the field complained of the difficulty of exposition.[3] In consequence, at the time of his address Baumol appeared to have had insufficient feedback from sufficiently genetically diverse sources for a balanced appraisal of his team's contribution. The result was a hard sell targeted at the non-specialist and incorporating somewhat exaggerated claims as to the capabilities of the theory.[4]

Since then further research, prompted by the controversial address, has clarified certain issues. The cost analysis employed by Baumol et al has been accepted by the profession virtually without reservation.[5] The idea of unsustainability, however, has not fared quite so well and as noted in Chapter 4 has been greeted with considerable doubt. But it is the concept of contestability, the cornerstone of Baumol's normative analysis, that has precipitated greatest controversy. The attacks made have proceeded essentially along two different fronts, the logical and the existential. With respect to the latter, W.G. Shepherd, as discussed in Chapter 3, has endeavoured to argue that the conditions required for the realisation of perfect contestability are so strong and the empirical evidence of cases of their satisfaction so absent that the concept is no more than a mere theorist's toy.[6] Concerning the former, several efforts have been made to undermine the logical integrity of the concept by focussing on inconsistencies that can arise under a variety of specific, extreme circumstances.[7]

The success of these criticisms, however, is questionable. Baumol et al have managed to refute or at least contain most of the logical questions [8] and in any case even if it is possible to question the logical integrity of the perfectly contestable concept this, in itself, is insufficient reason for its wholesale rejection. After all, physicists can envision situations in which the law of gravity would not apply though these are of no relevance to the building of bridges on earth. If one accepts the view that the role of theory can be interpreted with more licence, as a sort of Aesop's Fable with a moral taking us to a new perception of reality, then surely contestability has a place even if, under certain pathological circumstances, its logic is found not completely unassailable. As for the existential critique of Shepherd, this was tackled head on in Chapter 3 and it was shown that the observable characteristics of the industry closely approach what is required for contestability.

It is suggested then, that both the contestability and the cost concepts developed by Baumol et al are relevant and important tools in the economic analysis of liner shipping.

With respect to contestability, it was shown that in the liner industry sunk costs were low, entrant and incumbent - on intra OECD trades at least- were symmetrically placed and the price sustainability condition was satisfied. Entry and exit, moreover, was frequent, hit-and-run entry common, and the quantitative impact of entry often very substantial. It consequently appears reasonable to conclude that the industry is highly contestable. The implications of such a situation are that profits will be low - something generally supported by empirical evidence - firms will be forced to operate with maximal efficiency and that the allocation of resources in the industry will be desirable. Since prolonged inefficiency cannot be sustained in such a situation, the presence of conferences and their longevity indicates that they must confer some survival value and be doing something positive to promote general cost efficiency.

Turning now to costs, it was shown that a large proportion of the inputs used in liner shipping are public inputs which give rise to substantial common costs. These inputs and costs, in turn, imply the presence of significant economies of scope, something which for its part provides an economic rationale for the industry's patent multiproduct service offerings. The very same cost characteristics are also an important determinant of the industry's pricing structure: given the preponderance of common costs, assignable incremental costs will, of necessity, be less than any measure of average costs thus creating a situation similar to increasing returns to scale wherein marginal cost pricing is not financially feasible. Firms, therefore, will be forced to adopt a form of constrained Ramsey pricing, with the constraints arising from both the overall threshold of entry and from the fact that competition generally in the industry has several characteristics which could be interpreted as sources of unsustainability.

Concerning unsustainability, several potential sources were identified, those of greatest consequence being market failure due to a missing market for ensured access to liner services, market niching, intermodal competition and rapid technical change. The principal result of all of these conditions is that in the industry there is no obvious and common normal profit equilibrium to which market forces might work. In consequence markets may remain for long periods in a state of disequilibrium and instability, conditions which are seemingly observed but which are at variance with the predictions of traditional oligopoly models. Despite the valuable insights provided by Baumol et al in explaining the possible roots of such instability, it was noted that considerable doubts have been expressed over the policy relevance of unsustainability, particularly as to whether the benefits of its cure exceed the costs of its continuation.

It was noted in Chapter 5 that although Canadian liner trades appear highly contestable now it was nevertheless possible to envisage situations under which this conclusion might change. Indeed, a variety of potential impediments to contestability were identified including terminal facilities, contractual practices, goodwill, depressed trading conditions, conferences, multimodal service developments and maritime promotion policies. Of these all were judged generally innocuous save maritime promotion policies which were shown to be potentially severely disruptive to commercial liner shipping and the contestability of liner markets.

Having isolated possible impediments to contestability, Chapter 6 addressed the ways by which market contestability may be maintained or enhanced. Influencing the environment of the industry or the active intervention by government into market behaviour were identified as the media here. Any such government involvement, however, should proceed only pursuant to the establishment of serious departures from the conditions required for contestability and hence it was shown an ongoing surveillance of conference practices , the rate and impact of entry and exit, profit levels and the environmental conditions dictating the degree to which the contestability conditions can be realised, would be prudent.

In conclusion, then, the study suggests that the theory of contestable markets, as developed by Baumol, Panzar and Willig, is a device well worthy of inclusion in the arsenal of the maritime economist. Despite its still controversial standing in the profession, it appears eminently appropriate for the analysis of the industry and simultaneously is suggestive of policy advice which, if not original, is by no means unreasonable.

Notes and References

[1] Some of the papers upon which Baumol et al's book is based date back to 1971 and many of the ideas have much earlier antecedents. See both the Acknowledgements and bibliography in Baumol, W.J., Panzar, J.C. and Willig, R.D., "Contestable Markets and the Theory of Industry Structure," Harcourt Brace Jovanovich, New York 1982.

[2] See Baumol, W.J., "Contestable Markets: An Uprising in the Theory of Industry Structure," American Economic Review, Volume 72, March 1982, pp. 1-15.

[3] See eg. Spence, M., "Contestable Markets and the Theory of Industry Structure: A Review Article," Journal of Economic Literature, Volume 21, September 1983, p. 989.

[4] See eg. Shepherd, W.G., "Contestability vs. Competition," American Economic Review, Volume 74, September 1984, p. 572 n.2.

[5] Ibid.

[6] Ibid passim.

[7] See eg. Brock, W.A., "Contestable Markets and the Theory of Industry Structure: A Review Article," Journal of Political Economy, Volume 91, December 1983, pp. 1055-1066; Schwartz, M. and Reynolds, R.J., "Contestable Markets: An Uprising in the Theory of Industry Structure: Comment," American Economic Review, Volume 73, June 1983; and Weitzman, Martin L., "Contestable Markets: An Uprising in the Theory of Industry Structure: Comment," American Economic Review, Volume 73, June 1983.

[8] Baumol, W.J., Panzar, J.C., and Willig, R.D., "Contestable Markets: An Uprising in The Theory of Industry Structure: Reply," American Economic Review, Volume 73, June 1983.